Airwell Residential

AIRWELL ▪ ELECTRA ▪ JOHNSON

Airwell

Service Manual

HKD DCI Series

Indoor Units	Outdoor Units
AWSI-HKD009-N11	AWAU-YKD009-H11
AWSI-HKD012-N11	AWAU-YKD012-H11
AWSI-HKD018-N11	AWAU-YKD018-H11
AWSI-HKD024-N11	AWAU-YKD024-H11

REFRIGERANT

R410A

HEATPUMP

SM HKD DCI 1-A.1 GB

APRIL, 2014

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1. Precaution

1.1 Safety Precaution

- **To prevent injury to the user or other people and property damage, the following instructions must be followed.**
- **Incorrect operation due to ignoring instruction will cause harm or damage.**
- **Before service the unit, be sure to read this service manual at first.**

1.2 Warning

➢ Installation

- **Do not use a defective or underrated circuit breaker. Use this appliance on a dedicated circuit.**

There is risk of fire or electric shock.

- **For electrical work, contact the dealer, seller, a qualified electrician, or an authorized service center.**

Do not disassemble or repair the product, there is risk of fire or electric shock.

- **Always ground the product.**

There is risk of fire or electric shock.

- **Install the panel and the cover of control box securely.**

There is risk of fire of electric shock.

- **Always install a dedicated circuit and breaker.**

Improper wiring or installation may cause fore or electric shock.

- **Use the correctly rated breaker of fuse.**

There is risk of fire or electric shock.

- **Do not modify or extend the power cable.**

There is risk of fire or electric shock.

- **Do not install, remove, or reinstall the unit by yourself (customer).**

There is risk of fire, electric shock, explosion, or injury.

- **Be caution when unpacking and installing the product.**

Sharp edges could cause injury, be especially careful of the case edges and the fins on the

condenser and evaporator.

- **For installation, always contact the dealer or an authorized service center.**
- **Do not install the product on a defective installation stand.**
- **Be sure the installation area does not deteriorate with age.**

If the base collapses, the air conditioner could fall with it, causing property damage, product failure, and personal injury.

- **Do not let the air conditioner run for a long time when the humidity is very high and a door or a window is left open.**
- **Take care to ensure that power cable could not be pulled out or damaged during operation.**

There is risk of fire or electric shock.

- **Do not place anything on the power cable.**

There is risk of fire or electric shock.

- **Do not plug or unplug the power supply plug during operation.**

There is risk of fire or electric shock.

- **Do not touch (operation) the product with wet hands.**
- **Do not place a heater or other appliance near the power cable.**

There is risk of fire and electric shock.

- **Do not allow water to run into electrical parts.**

It may cause fire, failure of the product, or electric shock.

- **Do not store or use flammable gas or combustible near the product.**

There is risk of fire or failure of product.

- **Do not use the product in a tightly closed space for a long time.**

Oxygen deficiency could occur.

- **When flammable gas leaks, turn off the gas and open a window for ventilation before turn the product on.**
- **If strange sounds or smoke comes from product, turn the breaker off or disconnect the power supply cable.**

There is risk of electric shock or fire.

- **Stop operation and close the window in storm or hurricane. If possible, remove the**

product from the window before the hurricane arrives.

There is risk of property damage, failure of product, or electric shock.

- **Do not open the inlet grill of the product during operation. (Do not touch the electrostatic filter, if the unit is so equipped.)**

There is risk of physical injury, electric shock, or product failure.

- **When the product is soaked, contact an authorized service center.**

There is risk of fire or electric shock.

- **Be caution that water could not enter the product.**

There is risk of fire, electric shock, or product damage.

- **Ventilate the product from time to time when operating it together with a stove etc.**

There is risk of fire or electric shock.

- **Turn the main power off when cleaning or maintaining the product.**

There is risk of electric shock.

- **When the product is not be used for a long time, disconnect the power supply plug or turn off the breaker.**

There is risk of product damage or failure, or unintended operation.

- **Take care to ensure that nobody could step on or fall onto the outdoor unit.**

This could result in personal injury and product damage.

➢ CAUTION

- **Always check for gas (refrigerant) leakage after installation or repair of product.**

Low refrigerant levels may cause failure of product.

- **Install the drain hose to ensure that water is drained away properly.**

A bad connection may cause water leakage.

- **Keep level even when installing the product.**

It can avoid vibration of water leakage.

- **Do not install the product where the noise or hot air from the outdoor unit could damage the neighborhoods.**

It may cause a problem for your neighbors.

- **Use two or more people to lift and transport the product.**
- **Do not install the product where it will be exposed to sea wind (salt spray) directly.**

It may cause corrosion on the product. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient operation.

➢ Operational

- **Do not expose the skin directly to cool air for long time. (Do not sit in the draft).**
- **Do not use the product for special purposes, such as preserving foods, works of art etc. It is a consumer air conditioner, not a precision refrigerant system.**

There is risk of damage or loss of property.

- **Do not block the inlet or outlet of air flow.**
- **Use a soft cloth to clean. Do not use harsh detergents, solvents, etc.**

There is risk of fire, electric shock, or damage to the plastic parts of the product.

- **Do not touch the metal parts of the product when removing the air filter. They are very sharp.**
- **Do not step on or put anything on the product. (outdoor units)**
- **Always insert the filter securely. Clean the filter every two weeks or more often if necessary.**

A dirty filter reduces the efficiency of the air conditioner and could cause product malfunction or damage.

- **Do not insert hands or other objects through air inlet or outlet while the product is operated.**
- **Do not drink the water drained from the product.**
- **Use a firm stool or ladder when cleaning or maintaining the product.**

Be careful and avoid personal injury.

- **Replace the all batteries in the remote control with new ones of the same type. Do not mix old and new batteries or different types of batteries.**

There is risk of fire or explosion.

- **Do not recharge or disassemble the batteries. Do not dispose of batteries in a fire.**

They may burn of explode.

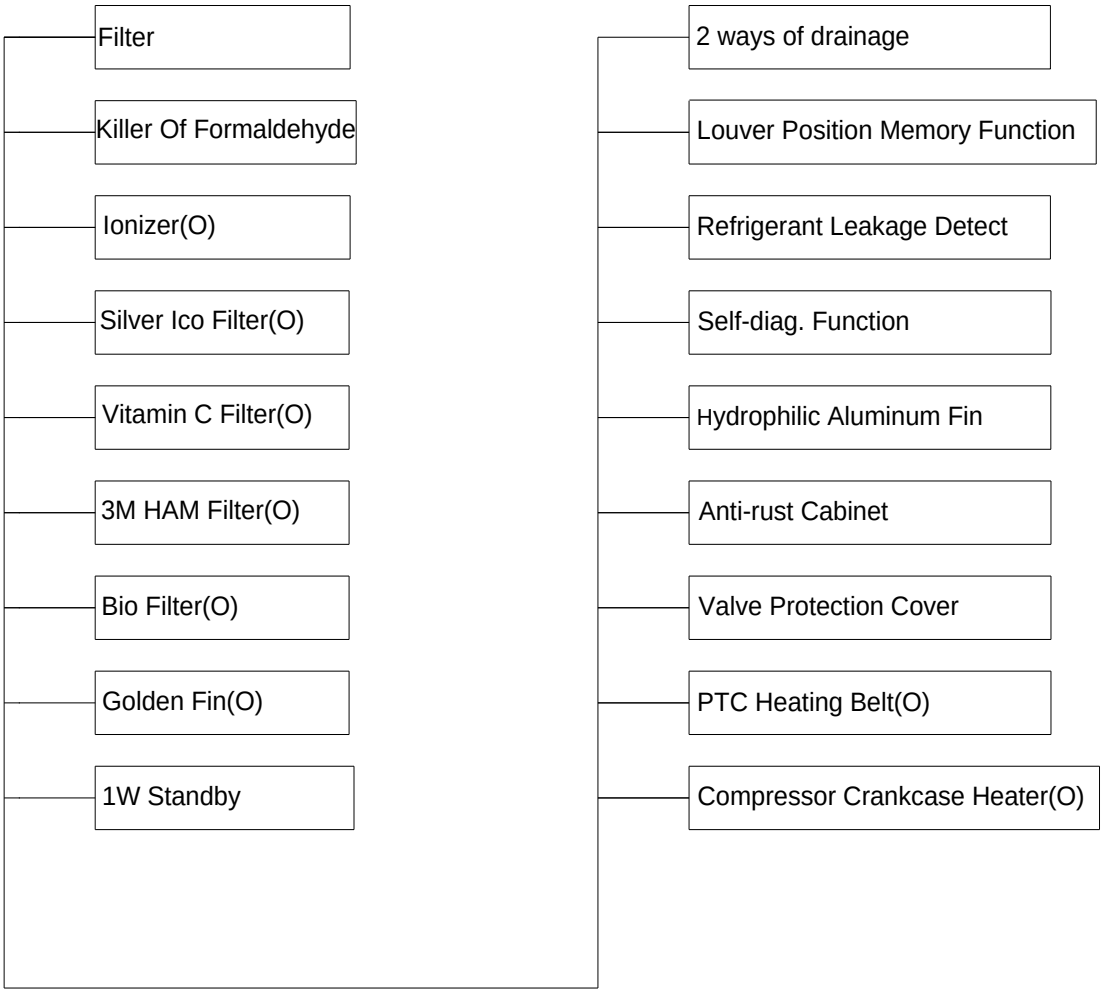
- **If the liquid from the batteries gets onto your skin or clothes, wash it well with clean water. Do not use the remote of the batteries have leaked.**

2. Part Names And Functions

2.1 Model Names of Indoor/Outdoor units

Series	Capacity	Indoor units	Outdoor units
Inverter	9k	AWSI-HKD009-N11	AWAU-YKD009-H11
	12k	AWSI-HKD012-N11	AWAU-YKD012-H11
	18k	AWSI-HKD018-N11	AWAU-YKD018-H11
	24k	AWSI-HKD024-N11	AWAU-YKD024-H11

2.2 Functions of Indoor/Outdoor units



O: optional function

3. Specification

Model Indoor Unit				AWSI-HKD009-N11	
Model Outdoor Unit				AWAU-YKD009-H11	
Installation Method of Pipe				Flared	
Characteristics			**Units**	**Cooling**	**Heating**
					Average
Capacity (1)			kW	2.70(1.0~3.2)	2.8(1.0~3.4)
Pdesign			kW	2.7	2.4
SEER /SCOP (2)			W/W	5.8	3.8
Energy efficiency class				A+	A
Annual energy consumption			kWh	163	884
Tbiv			ºC	N/A	-7
Tol			ºC	N/A	-15
Power supply			V/Ph/Hz	220-240V/Single/50Hz	
Circuit breaker rating			A	10	
INDOOR	Fan type & quantity			Cross flow fan x1	
	Fan speeds	H/M/L	RPM	1150/1000 /800	1150/1000/ 800
	Air flow (3)	H/M/L	m3/hr	620/540/440	620/540/440
	External static pressure	Min-Max	Pa	0	
	Sound power level (4)	H/M/L	dB(A)	58	
	Sound pressure level(5)	H/M/L	dB(A)	42/38/30	
	Moisture removal		l/hr	1.0	
	Condensate drain tube I.D		mm	16	
	Dimensions	WxHxD	mm	800 x275x188	
	Weight		kg	6.5	
	Package dimensions	LxWxH	mm	865 x350x265	
	Packaged weight		kg	9.5	
	Stacking height		units	8	
OUTDOOR	Refrigerant control			Capillary tube	
	Compressor type, model			Rotary DC Inverter	
	Fan type & quantity			Axial x 1	
	Fan speeds	H/L	RPM	800	
	Air flow	H/L	m3/hr	1800	
	Sound power level(4)	H/L	dB(A)	64	
	Sound pressure level(5)	H/L	dB(A)	52	
	Dimensions	WxHxD	mm	780 x540x250	
	Weight		kg	27.5	
	Package dimensions	LxWxH	mm	910x335x585	
	Packaged weight		kg	30	
	Stacking height		Units	5	
	Refrigerant type			R410A	
	Refrigerant charge (standard connecting tubing length)		kg(5m)	0.8	
	Additional charge per 1 meter		gr / 1m	15	
	Connections between units	Liquid line	In.(mm)	1/4" (6.35)	
		Suction line	In.(mm)	3/8"(9.52)	
		Max.tubing length	m.	20	
		Max.height difference	m.	8	
Operation control type				Remote control	
Heating elements			kW		
Others					

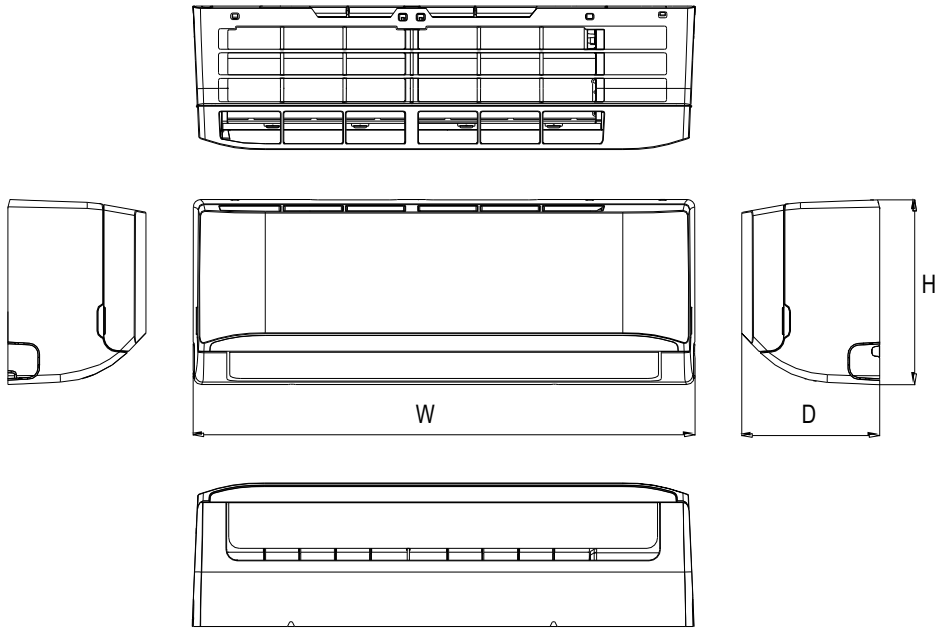
Model Indoor Unit				AWSI-HKD012-N11	
Model Outdoor Unit				AWAU-YKD012-H11	
Installation Method of Pipe				Flared	
Characteristics			**Units**	**Cooling**	**Heating**
					Average
Capacity (1)			kW	3.2(1.2~3.8)	3.5(1.2~4.0)
Pdesign			kW	3.2	3.05
SEER /SCOP (2)			W/W	5.8	3.8
Energy efficiency class				A+	A
Annual energy consumption			kWh	193	1124
Tbiv			°C	N/A	-7
Tol			°C	N/A	-15
Power supply			V/Ph/Hz	220-240V/Single/50Hz	
Circuit breaker rating			A	10	
INDOOR	Fan type & quantity			Cross flow fan x1	
	Fan speeds	H/M/L	RPM	1200 /1050 /800	1200/1050 /800
	Air flow (3)	H/M/L	m3/hr	630/550/430	630/550/430
	External static pressure	Min-Max	Pa	0	
	Sound power level (4)	H/M/L	dB(A)	58	
	Sound pressure level(5)	H/M/L	dB(A)	43/39/31	
	Moisture removal		l/hr	1.1	
	Condensate drain tube I.D		mm	16	
	Dimensions	WxHxD	mm	800 x275x188	
	Weight		kg	7.5	
	Package dimensions	LxWxH	mm	865 x350x265	
	Packaged weight		kg	9.5	
	Stacking height		units	8	
OUTDOOR	Refrigerant control			Capillary tube	
	Compressor type, model			Rotary DC Inverter	
	Fan type & quantity			Axial x 1	
	Fan speeds	H/L	RPM	800	
	Air flow	H/L	m3/hr	1800	
	Sound power level(4)	H/L	dB(A)	64	
	Sound pressure level(5)	H/L	dB(A)	53	
	Dimensions	WxHxD	mm	780 x540x250	
	Weight		kg	27.5	
	Package dimensions	LxWxH	mm	910x335x585	
	Packaged weight		kg	29.5	
	Stacking height		Units	5	
	Refrigerant type			R410A	
	Refrigerant charge (standard connecting tubing length)		kg(5m)	0.95	
	Additional charge per 1 meter		gr / 1m	15	
	Connections between units	Liquid line	In.(mm)	1/4"(6.35)	
		Suction line	In.(mm)	3/8"(9.52)	
		Max.tubing length	m.	20	
		Max.height difference	m.	8	
Operation control type				Remote control	
Heating elements			kW		
Others					

Model Indoor Unit				AWSI-HKD018-N11	
Model Outdoor Unit				AWAU-YKD018-H11	
Installation Method of Pipe				Flared	
Characteristics			**Units**	**Cooling**	**Heating**
					Average
Capacity (1)			kW	5.0(1.4~6.2)	5.1(1.4~6.4)
Pdesign			kW	5	4.8
SEER /SCOP (2)			W/W	6.5	3.8
Energy efficiency class				A++	A
Annual energy consumption			kWh	269	1768
Tbiv			°C	N/A	-6
Tol			°C	N/A	-15
Power supply			V/Ph/Hz	220-240V/Single/50Hz	
Circuit breaker rating			A	16	
INDOOR	Fan type & quantity			Cross flow fan x1	
	Fan speeds	H/M/L	RPM	1100 / 800 / 700	1150 / 800 / 700
	Air flow (3)	H/M/L	m3/hr	730/480/400	760/480/400
	External static pressure	Min-Max	Pa	0	
	Sound power level (4)	H/M/L	dB(A)	58	
	Sound pressure level(5)	H/M/L	dB(A)	43/40/33	
	Moisture removal		l/hr	1.7	
	Condensate drain tube I.D		mm	16	
	Dimensions	WxHxD	mm	940 x275x205	
	Weight		kg	9.5	
	Package dimensions	LxWxH	mm	1015 x350x265	
	Packaged weight		kg	12.5	
	Stacking height		units	8	
OUTDOOR	Refrigerant control			Capillary tube	
	Compressor type, model			Rotary DC Inverter	
	Fan type & quantity			Axial x 1	
	Fan speeds	H/L	RPM	800	
	Air flow	H/L	m3/hr	2200	
	Sound power level(4)	H/L	dB(A)	65	
	Sound pressure level(5)	H/L	dB(A)	55	
	Dimensions	WxHxD	mm	760 x590x285	
	Weight		kg	35	
	Package dimensions	LxWxH	mm	887x355x645	
	Packaged weight		kg	37.5	
	Stacking height		units	4	
	Refrigerant type			R410A	
	Refrigerant charge (standard connecting tubing length)		kg(5m)	1.25	
	Additional charge per 1 meter		gr / 1m	15	
	Connections between units	Liquid line	In.(mm)	1/4"(6.35)	
		Suction line	In.(mm)	1/2"(12.7)	
		Max.tubing length	m.	20	
		Max.height difference	m.	8	
Operation control type				Remote control	
Heating elements			kW		
Others					

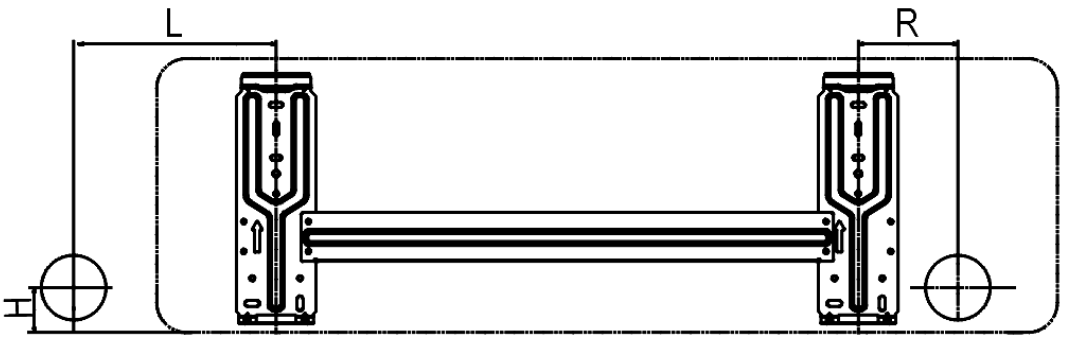
Model Indoor Unit				AWSI-HKD024-N11	
Model Outdoor Unit				AWAU-YKD024-H11	
Installation Method of Pipe				Flared	
Characteristics			**Units**	**Cooling**	**Heating**
					Average
Capacity (1)			kW	6.25(2.5~7.2)	7.0(2.5~7.5)
Pdesign			kW	6.25	6.3
SEER /SCOP (2)			W/W	6.2	3.8
Energy efficiency class				A++	A
Annual energy consumption			kWh	353	2321
Tbiv			°C	N/A	-6
Tol			°C	N/A	-15
Power supply			V/Ph/Hz	220-240V/Single/50Hz	
Circuit breaker rating			A	25	
INDOOR	Fan type & quantity			Cross flow fan x1	
	Fan speeds	H/M/L	RPM	1180/1100/ 900	1180/1100 / 900
	Air flow (3)	H/M/L	m3/hr	1150/1050/900	1150/1050/900
	External static pressure	Min-Max	Pa	0	
	Sound power level (4)	H/M/L	dB(A)	64	
	Sound pressure level(5)	H/M/L	dB(A)	50/47/41	
	Moisture removal		l/hr	2.4	
	Condensate drain tube I.D		mm	16	
	Dimensions	WxHxD	mm	1045 x315x235	
	Weight		kg	12.2	
	Package dimensions	LxWxH	mm	1135 x315x395	
	Packaged weight		kg	15.3	
	Stacking height		units	8	
OUTDOOR	Refrigerant control			Capillary tube	
	Compressor type, model			Twin-rotary DC Inverter	
	Fan type & quantity			Axial x 1	
	Fan speeds	H/L	RPM	850	
	Air flow	H/L	m3/hr	2700	
	Sound power level(4)	H/L	dB(A)	69	
	Sound pressure level(5)	H/L	dB(A)	58	
	Dimensions	WxHxD	mm	845 x700x320	
	Weight		kg	46.7	
	Package dimensions	LxWxH	mm	965x395x755	
	Packaged weight		kg	50	
	Stacking height		units	3	
	Refrigerant type			R410A	
	Refrigerant charge (standard connecting tubing length)		kg(5m)	1.95	
	Additional charge per 1 meter		gr / 1m	30	
	Connections between units	Liquid line	In.(mm)	3/8"(9.52)	
		Suction line	In.(mm)	5/8"(15.9)	
		Max.tubing length	m.	25	
		Max.height difference	m.	10	
Operation control type				Remote control	
Heating elements			kW		
Others					

4. Dimension

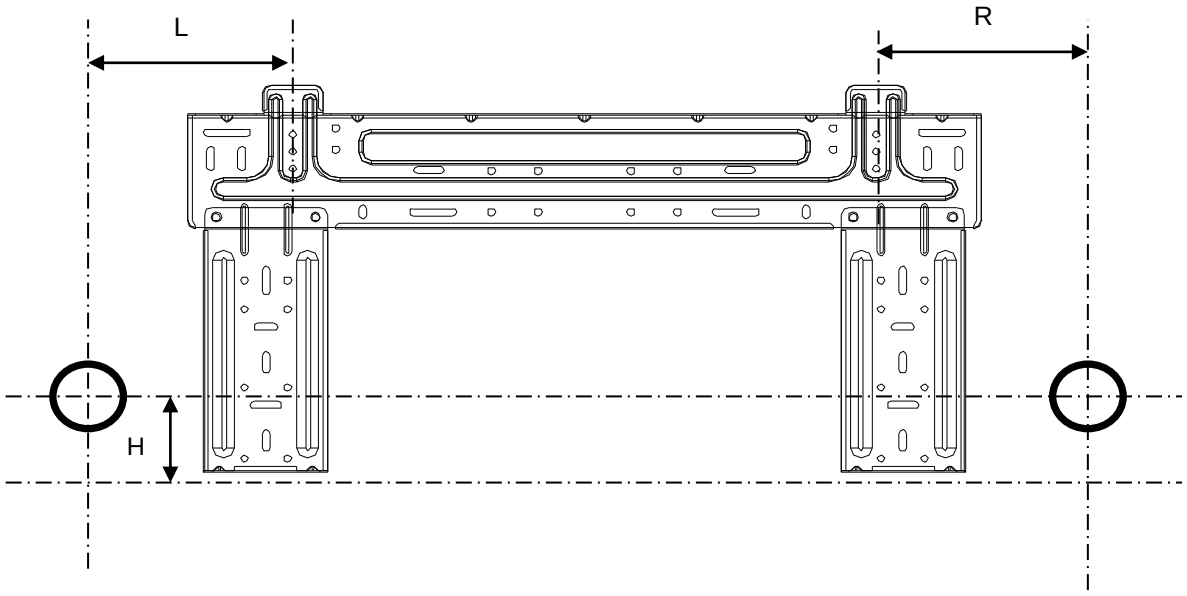
4.1 Indoor Unit



Model	W	D	H
AWSI-HKD009-N11	800	188	275
AWSI-HKD012-N11	800	188	275
AWSI-HKD018-N11	940	205	275
AWSI-HKD024-N11	1045	235	315

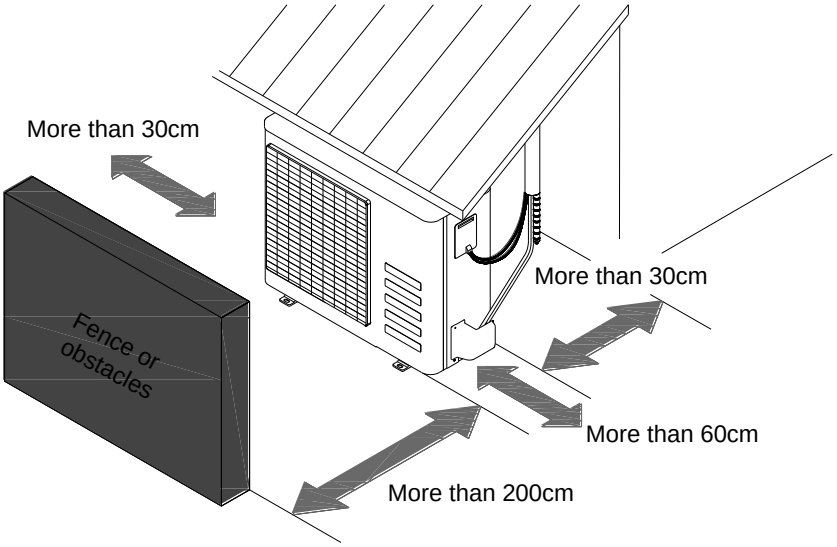


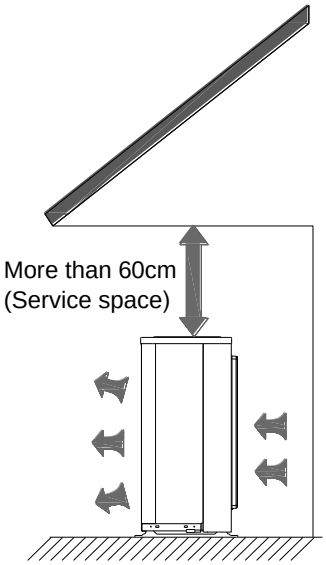
Model	L(mm)	R(mm)	H(mm)	Dimension of installation hole(mm)
AWSI-HKD009-N11	100	95	45	¢65
AWSI-HKD012-N11				
AWSI-HKD018-N11	110	100	45	



Model	L(mm)	R(mm)	H(mm)	Dimension of installation hole(mm)
AWSI-HKD024-N11	293	163	45	¢65

4.2 Outdoor Unit





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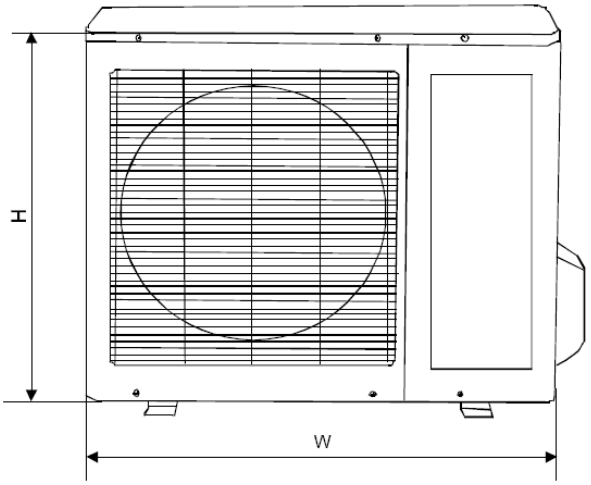
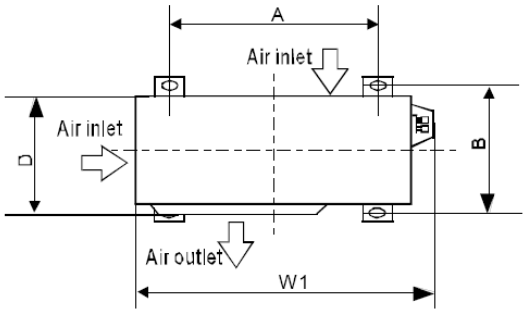
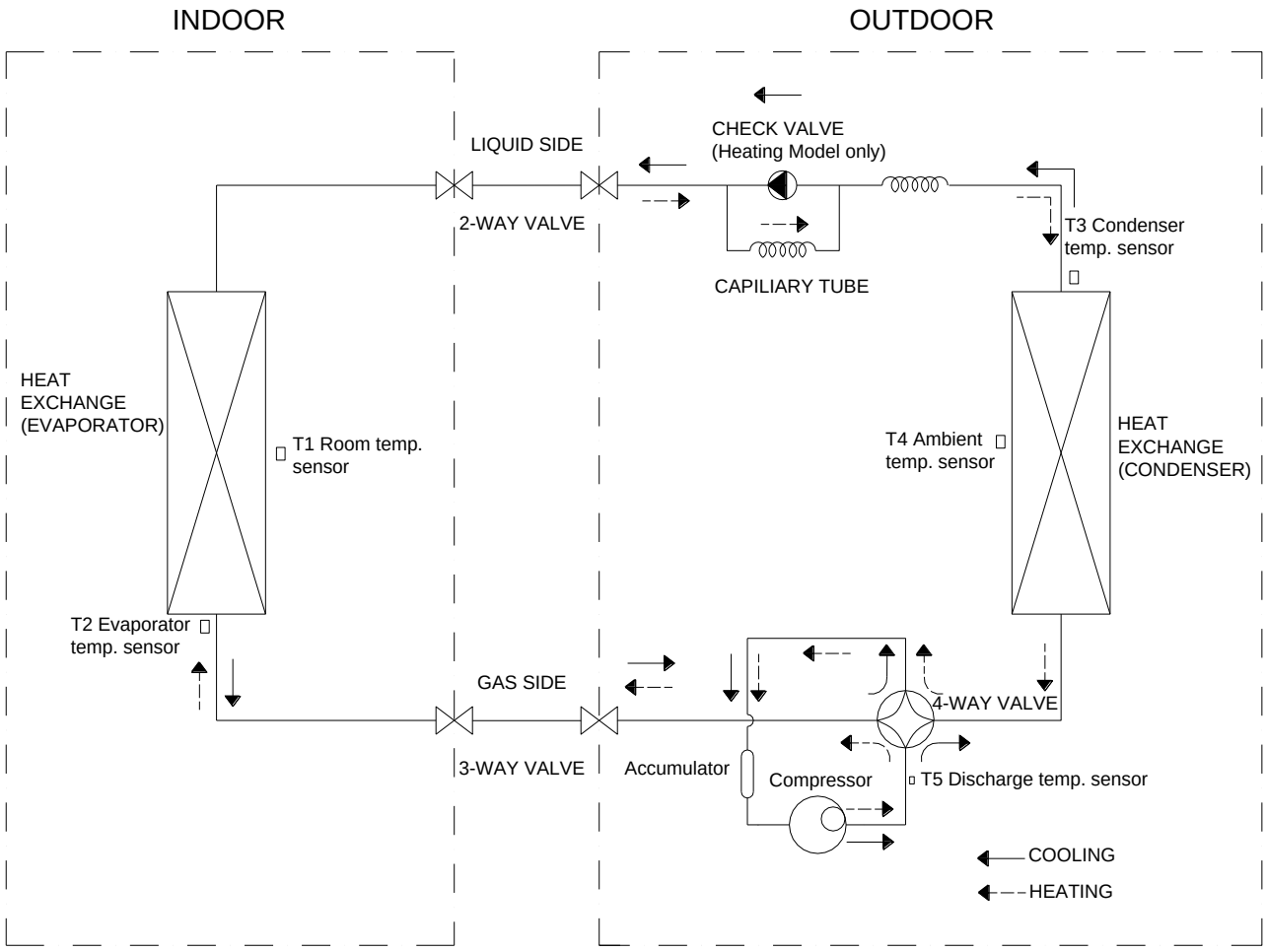




Model	W	D	H	W1	A	B
AWAU-YKD009-H11	780	250	540	843	549	276
AWAU-YKD012-H11	780	250	540	843	549	276
AWAU-YKD018-H11	760	285	590	823	530	290
AWAU-YKD024-H11	845	320	700	908	560	335

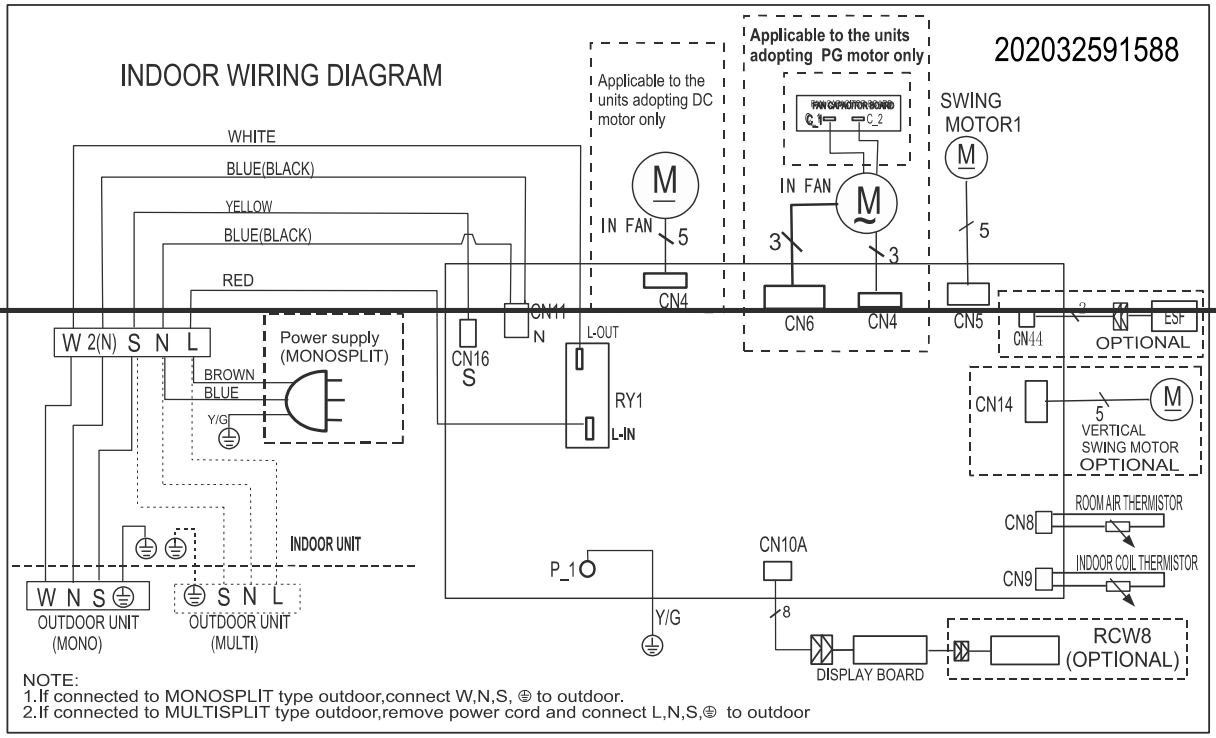
5. Refrigerant Cycle Diagram



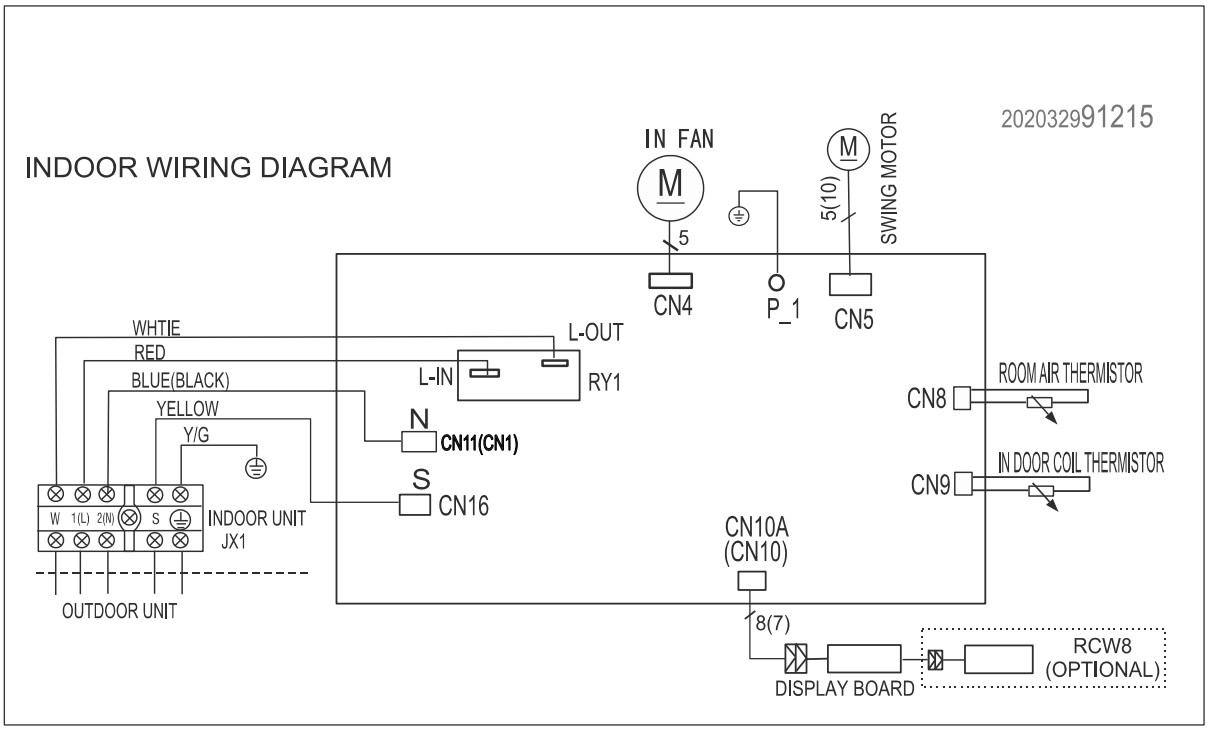
6. Wiring Diagram

6.1 Indoor Unit

AWSI-HKD009-N11, AWSI-HKD012-N11, AWSI-HKD018-N11

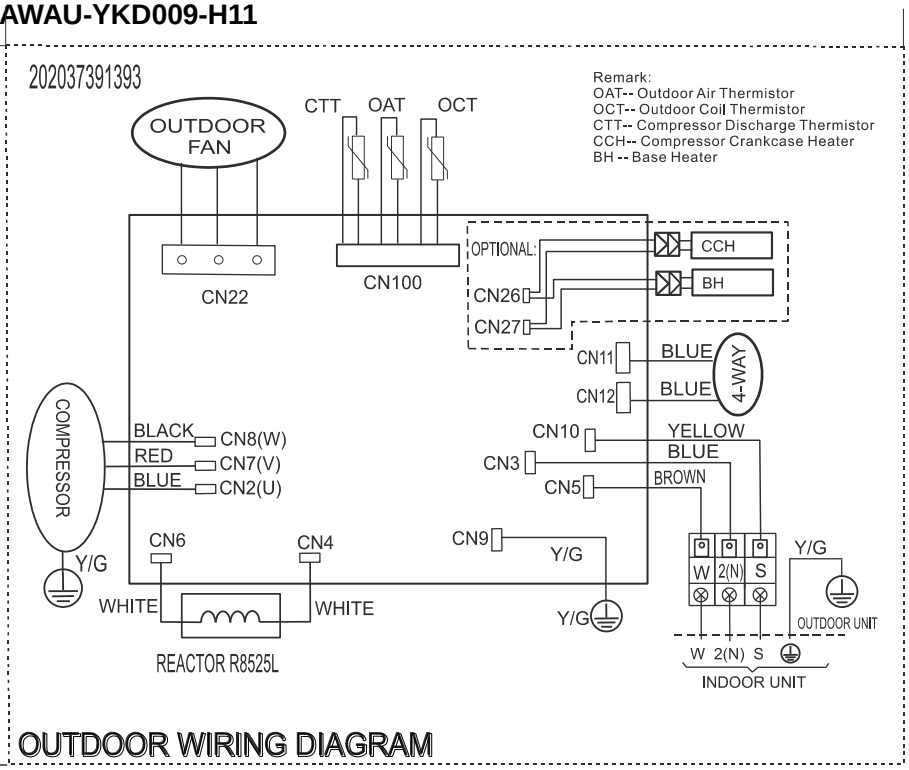


AWSI-HKD024-N11



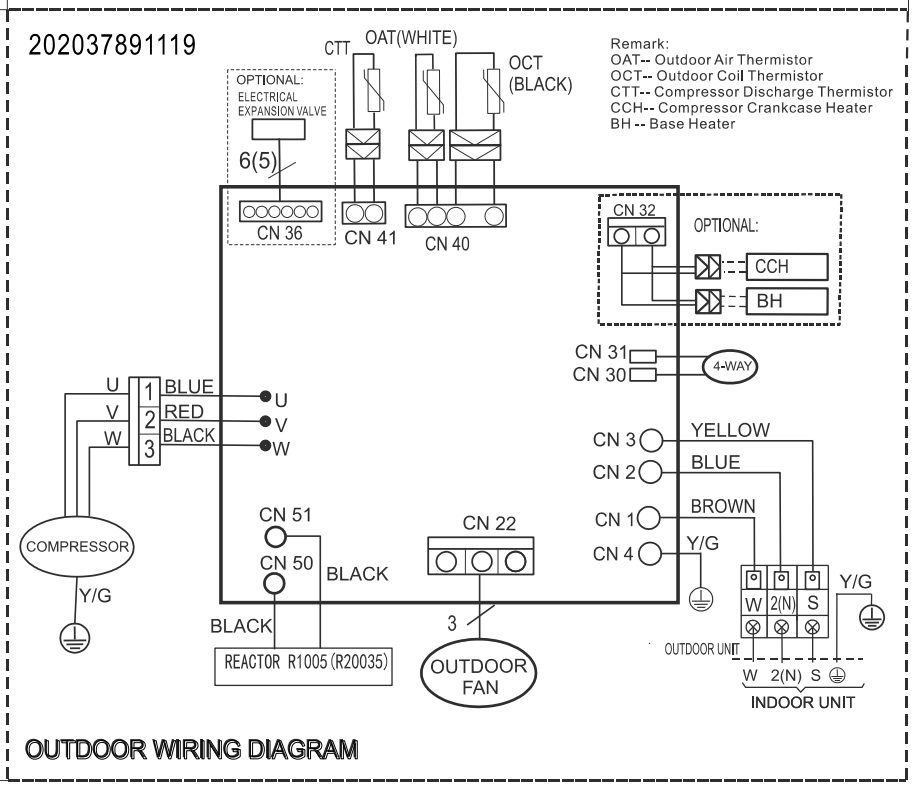
6.2 Outdoor Unit

AWAU-YKD009-H11



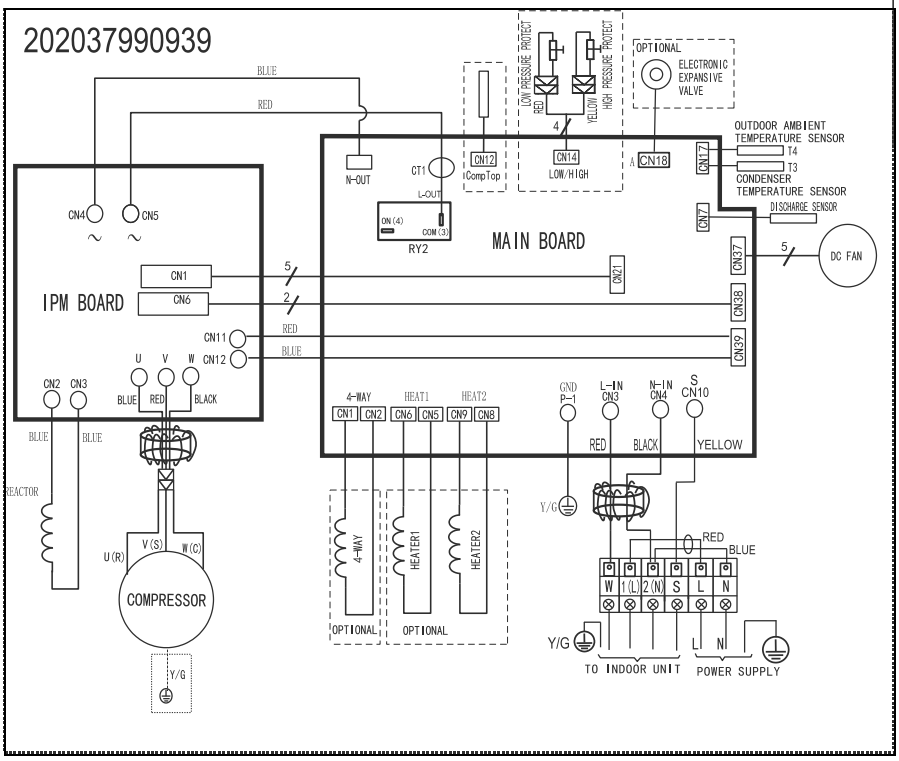
OUTDOOR WIRING DIAGRAM

AWAU-YKD012-H11, AWAU-YKD018-H11



OUTDOOR WIRING DIAGRAM

AWAU-YKD024-H11



7 Installation Details

7.1 Wrench torque sheet for installation

Outside diameter		Torque	Additional tightening torque
mm	inch	N.cm	N.cm
Φ6.35	1/4	1500(153kgf.cm)	1600(163kgf.cm)
Φ9.52	3/8	2500(255kgf.cm)	2600(265kgf.cm)
Φ12.7	1/2	3500(357kgf.cm)	3600(367kgf.cm)
Φ15.9	5/8	4500(459kgf.cm)	4700(479kgf.cm)
Φ19	3/4	6500(663kgf.cm)	6700(683kgf.cm)

7.2 Connecting the cables

The power cord of connect should be selected according to the following specifications sheet.

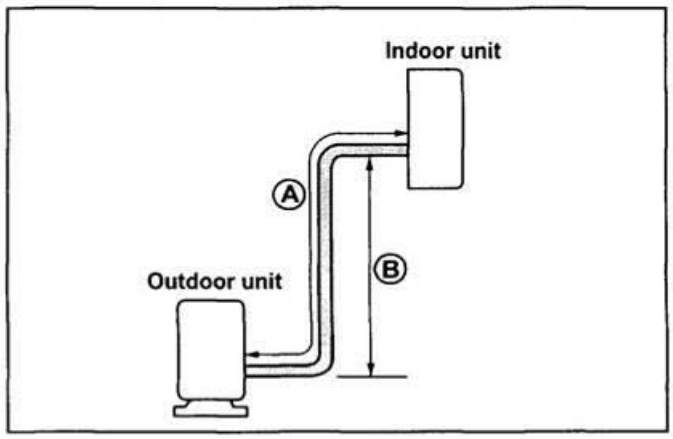
Rated current of appliance	Nominal cross-sectional area (mm^2)
>3 and ≤6	0.75
>6 and ≤10	1
>10 and ≤16	1.5
>16 and ≤25	2.5

The cable size and the current of the fuse or switch are determined by the maximum current indicated on the nameplate which located on the side panel of the unit. Please refer to the nameplate before selecting the cable, fuse and switch.

7.3 Pipe length and the elevation

The pipe length and refrigerant amount:

Model	Pipe size		Standard length (m)	Max. Elevation B (m)	Max. Length A (m)	Additional refrigerant (g/m)
	Gas	Liquid				
AWSI-HKD009-N11+AWAU-YKD009-H11	3/8" (Φ9.52)	1/4" (Φ6.35)	5	8	20	20
AWSI-HKD012-N11+AWAU-YKD012-H11			5	8	20	20
AWSI-HKD018-N11+AWAU-YKD018-H11	1/2" (Φ12.7)	1/4" (Φ6.35)	5	8	20	20
AWSI-HKD024-N11+AWAU-YKD024-H11	3/5" (Φ15.9)	3/8" (Φ9.52)	5	10	25	40

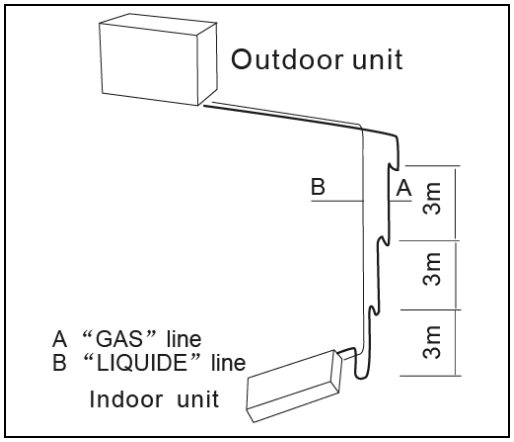


Caution:

The capacity test is based on the standard length and the maximum permissive length is basedon the system reliability.

Oil trap:

When the outdoor unit is installed above the indoor unit an oil trap is required every 3m along the suction line at the lowest point. In case the indoor unit is installed above the outdoor, no trap is required.



7.4 Installation for the first time

Air and moisture in the refrigerant system have undesirable effects as below:

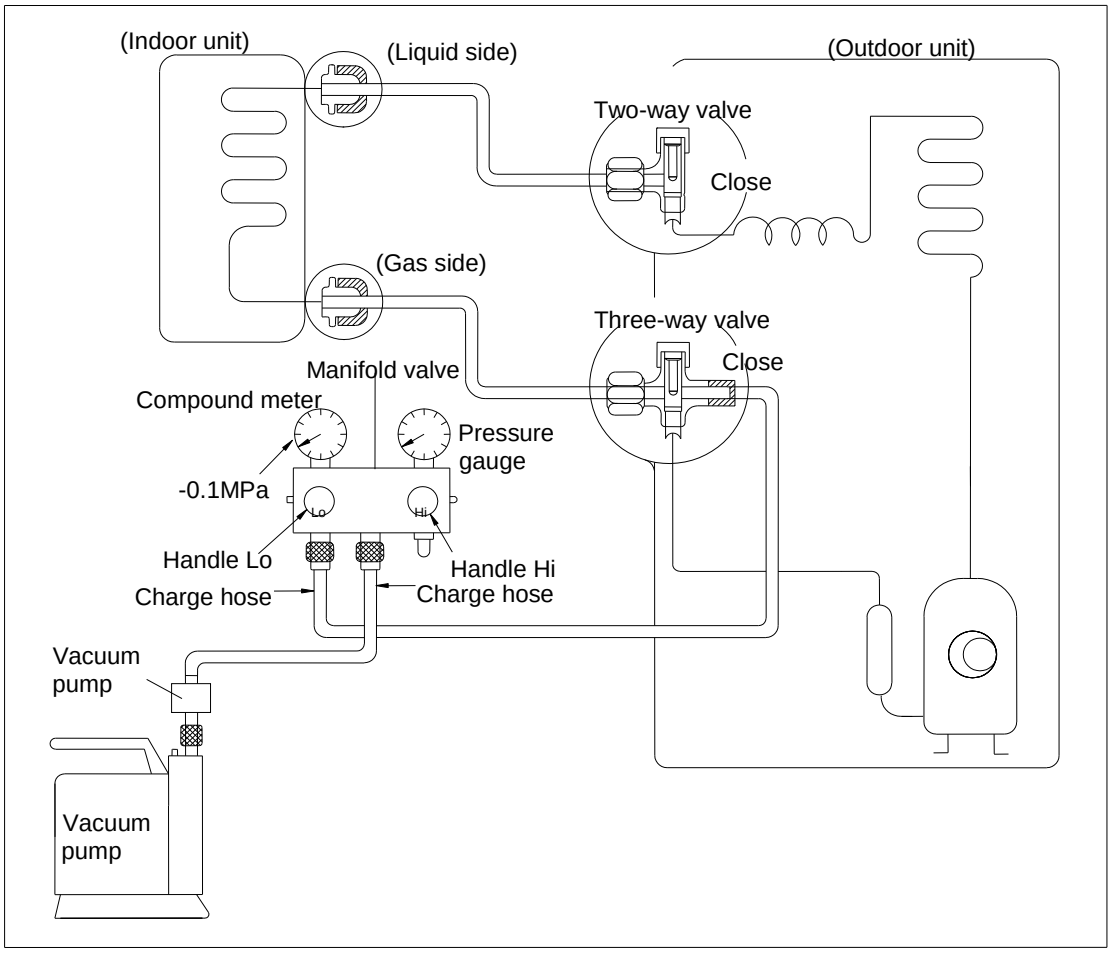
- Pressure in the system rises.
- Operating current rises.
- Cooling or heating efficiency drops.
- Moisture in the refrigerant circuit may freeze and block capillary tubing.
- Water may lead to corrosion of parts in the refrigerant system.

Therefore, the indoor units and the pipes between indoor and outdoor units must be leak tested and evacuated to remove gas and moisture from the system.

Gas leak check (Soap water method):

Apply soap water or a liquid neutral detergent on the indoor unit connections or outdoor unit connections by a soft brush to check for leakage of the connecting points of the piping. If bubbles come out, the pipes have leakage.

1. Air purging with vacuum pump



1) Completely tighten the flare nuts of the indoor and outdoor units, confirm that both the 2-way and 3-way valves are set to the closed position.
2) Connect the charge hose with the push pin of handle lo to the 3-way valves gas service port..
3) Connect the charge hose of handle hi connection to the vacuum pump.
4) Fully open the handle Lo of the manifold valve.
5) Operate the vacuum pump to evacuate.
6) Make evacuation for 30 minutes and check whether the compound meter indicates -0.1Mpa. If

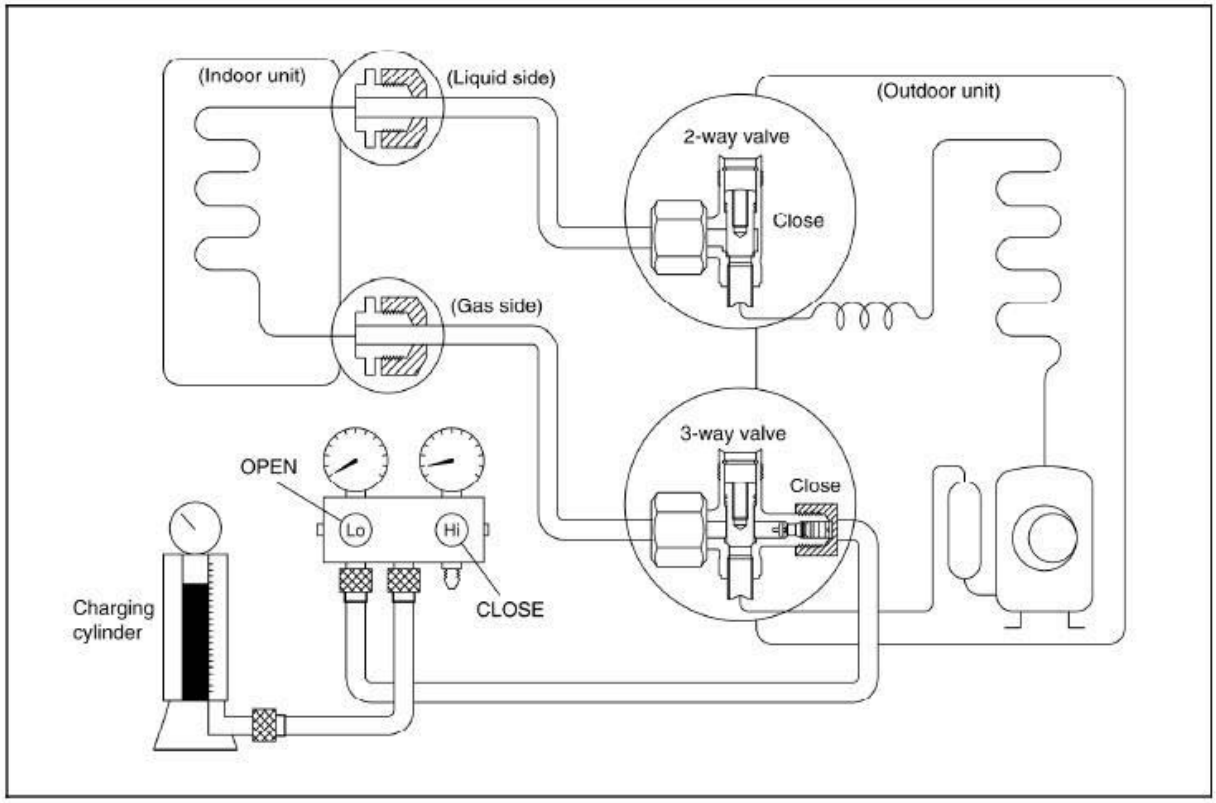
the meter does not indicate -0.1Mpa after pumping 30 minutes, it should be pumped 20 minutes more. If the pressure can't achieve -0.1Mpa after pumping 50 minutes, please check if there are some leakage points.

Fully close the handle Lo valve of the manifold valve and stop the operation of the vacuum pump. Confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).

7) Turn the flare nut of the 3-way valves about 45° counterclockwise for 6 or 7seconds after the gas coming out, then tighten the flare nut again. Make sure the pressure display in the pressure indicator is a little higher than the atmosphere pressure. Then remove the charge hose from the 3 way valve.

8) Fully open the 2 way valve and 3 way valve and securely tighten the cap of the 3 way valve.

2. Air purging by refrigerant



Procedure:

1). Confirm that both the 2-way and 3-way valves are set to the closed position.

2). Connect the charge set and a charging cylinder to the service port of the 3-way valve.

3). Air purging.

Open the valves on the charging cylinder and the charge set. Purge the air by loosening the flare nut on the 2-way valve approximately 45' for 3 seconds then closing it for 1 minute; repeat 3 times.

After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.

4). Check the gas leakage.

Check the flare connections for gas leakage.

5). Discharge the refrigerant.

Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45’ until the gauge indicates 0.3 to 0.5 Mpa.

6). Disconnect the charge set and the charging cylinder, and set the 2-way and 3-way valves to the open position.

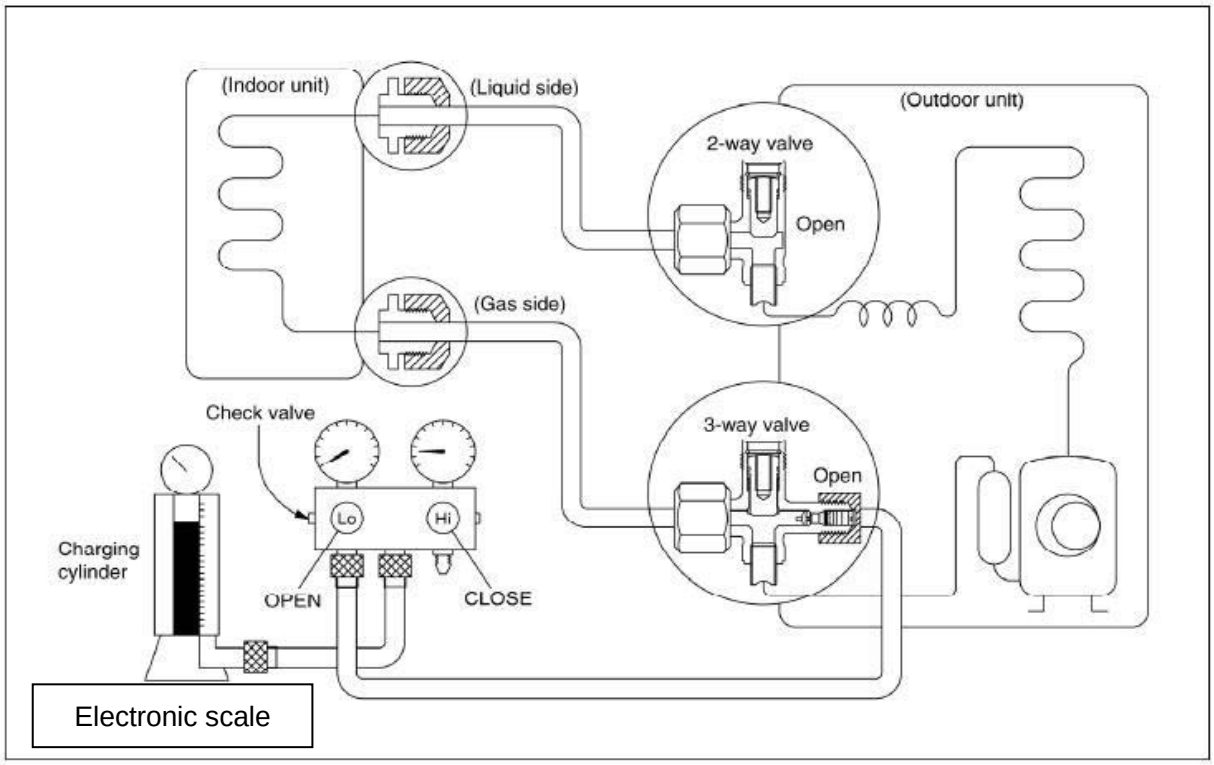
Be sure to use a hexagonal wrench to operate the valve stems.

7). Mount the valve stems nuts and the service port cap.

Be sure to use a torque wrench to tighten the service port cap to a torque 18N·m.

Be sure to check the gas leakage.

3. Adding the refrigerant if the pipe length >5m



Procedure:

1). Connect the charge hose to the charging cylinder, open the 2-way valve and the 3-way valve.

Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure the liquid charge.

2). Purge the air from the charge hose.

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto the electronic scale and record the weight.

4) Operate the air conditioner at the cooling mode.

5) Open the valves (Low side) on the charge set and charge the system with liquid refrigerant.

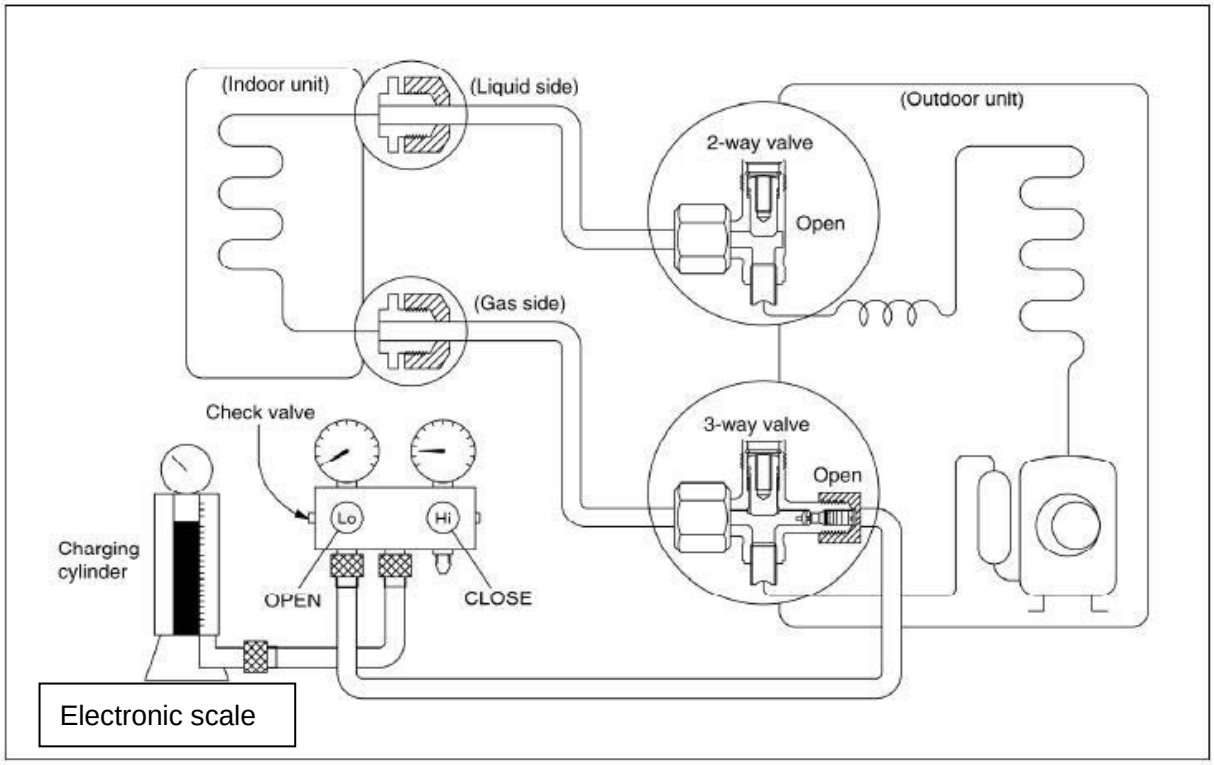
6).When the electronic scale displays the proper weight (refer to the table), disconnect the charge hose from the 3-way valve's service port immediately and turn off the air conditioner before disconnecting the hose.

7). Mount the valve stem caps and the service port

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

7.5 Adding the refrigerant after running the system for many years



Procedure:

1). Connect the charge hose to the 3-way service port, open the 2-way valve and the 3-way valve.

Connect the charge hose to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure liquid charge.

2). Purge the air from the charge hose.

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the

air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto the electronic scale and record the weight.

4) Operate the air conditioner at the cooling mode.

5) Open the valves (Low side) on the charge set and charge the system with liquid refrigerant.

6).When the electronic scale displays the proper weight (refer to the gauge and the pressure of the low side), disconnect the charge hose from the 3-way valve's service port immediately and turn off the air conditioner before disconnecting the hose.

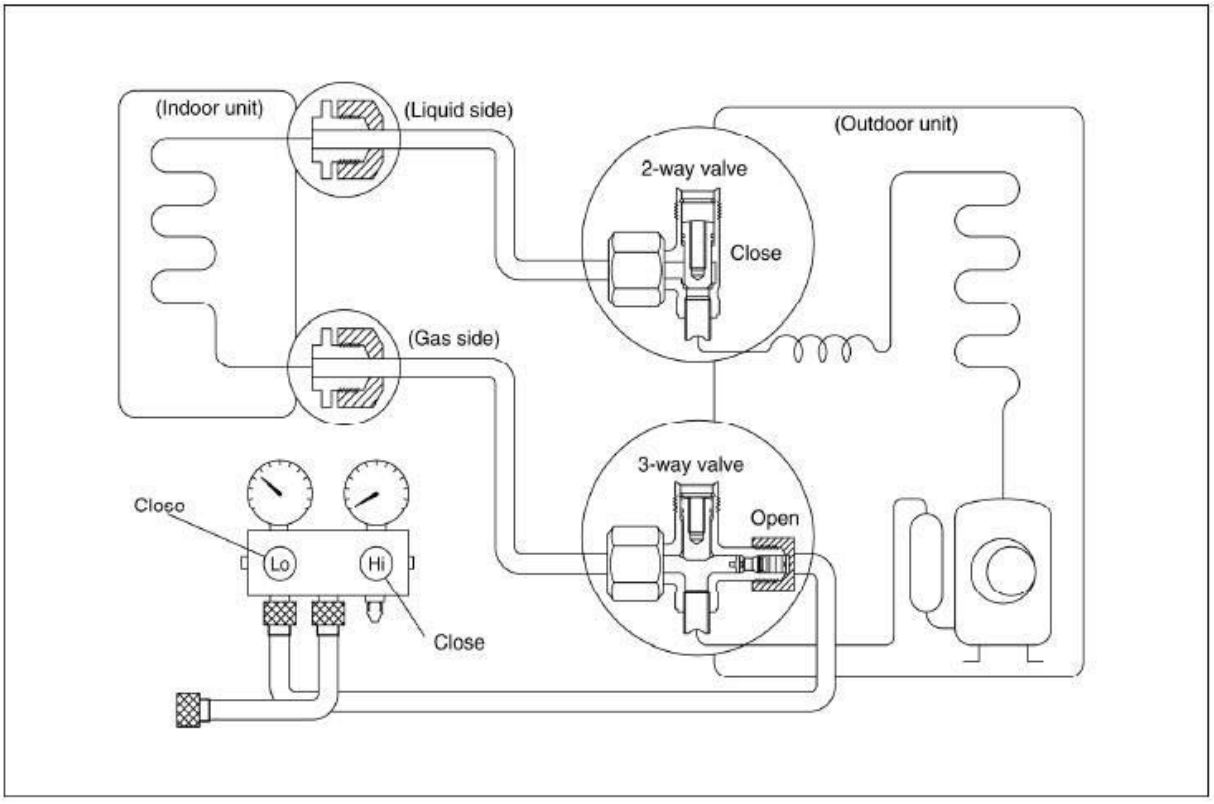
7). Mount the valve stem caps and the service port

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

7.6 Re-installation while the indoor unit need to be repaired

1. Collecting the refrigerant into the outdoor unit



Procedure

1). Confirm that both the 2-way and 3-way valves are set to the opened position

Remove the valve stem caps and confirm that the valve stems are in the opened position.

Be sure to use a hexagonal wrench to operate the valve stems.

2). Connect the charge hose with the push pin of handle lo to the 3-way valves gas service port.

3). Air purging of the charge hose.

Open the handle Lo valve of the manifold valve slightly to purge air from the charge hose for 5 seconds and then close it quickly.

4). Set the 2-way valve to the close position.

5). Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 0.1MPa.

6). Set the 3-way valve to the closed position immediately

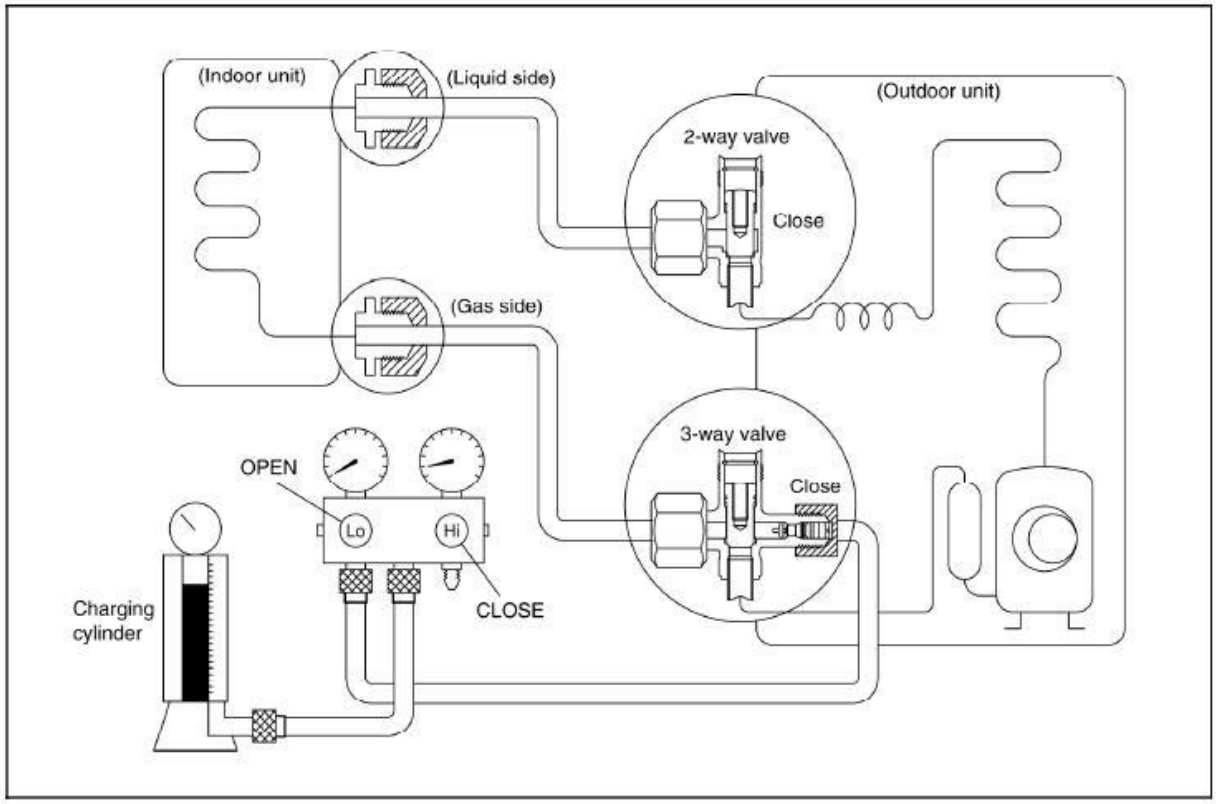
Do this quickly so that the gauge ends up indicating 0.3 to 0.5Mpa.

Disconnect the charge set, and tighten the 2-way and 3-way valve's stem nuts.

Use a torque wrench to tighten the 3-way valves service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

2. Air purging by the refrigerant



Procedure:

1). Confirm that both the 2-way and 3-way valves are set to the closed position.

2). Connect the charge set and a charging cylinder to the service port of the 3-way valve

Leave the valve on the charging cylinder closed.

3). Air purging.

Open the valves on the charging cylinder and the charge set. Purge the air by loosening the flare nut on the 2-way valve approximately 45’ for 3 seconds then closing it for 1 minute; repeat 3 times.

After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.

4). Check the gas leakage

Check the flare connections for gas leakage.

5). Discharge the refrigerant.

Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45’ until the gauge indicates 0.3 to 0.5 Mpa.

6). Disconnect the charge set and the charging cylinder, and set the 2-way and 3-way valves to the open position

Be sure to use a hexagonal wrench to operate the valve stems.

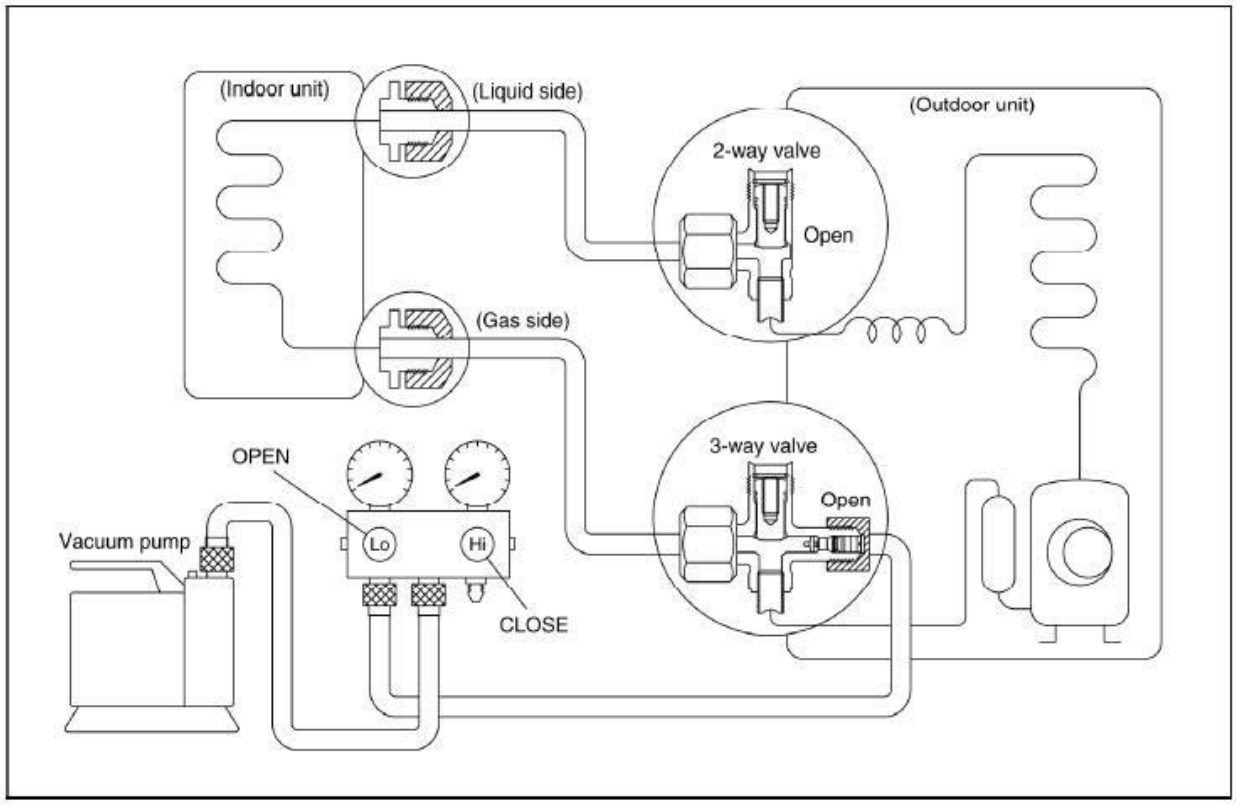
7). Mount the valve stems nuts and the service port cap

Be sure to use a torque wrench to tighten the service port cap to a torque 18N.m.

Be sure to check the gas leakage.

7.7 Re-installation while the outdoor unit need to be repaired

1. Evacuation for the whole system



Procedure:

1). Confirm that both the 2-way and 3-way valves are set to the opened position.

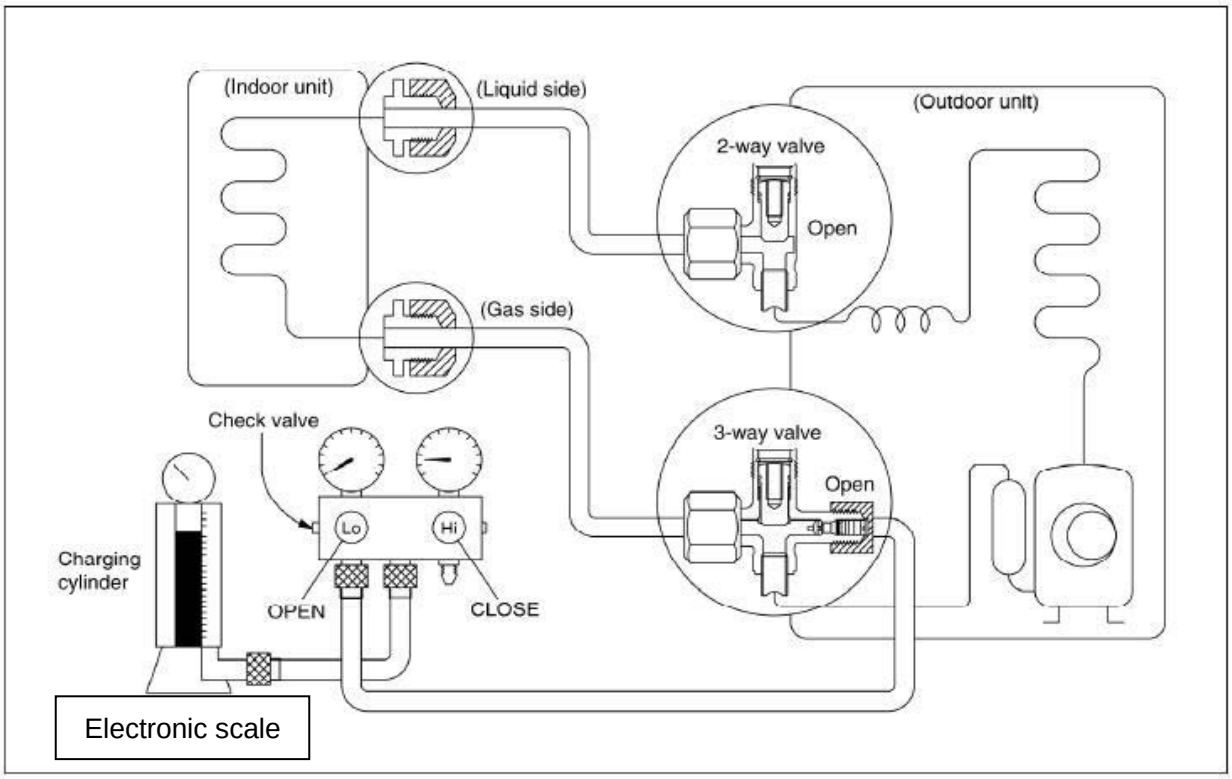
2). Connect the vacuum pump to 3-way valve's service port.

3). Evacuation for approximately one hour. Confirm that the compound meter indicates -0.1Mpa.

4). Close the valve (Low side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).

5). Disconnect the charge hose from the vacuum pump.

2. Refrigerant charging



Procedure:

1). Connect the charge hose to the charging cylinder, open the 2-way valve and the 3-way valve

Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure liquid charge.

2). Purge the air from the charge hose

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto the electronic scale and record the weight.

4). Open the valves (Low side) on the charge set and charge the system with liquid refrigerant

If the system cannot be charge with the specified amount of refrigerant, or can be charged with a little at a time (approximately 150g each time) , operating the air conditioner in the cooling cycle; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure.

5).When the electronic scale displays the proper weight, disconnect the charge hose from the 3-way valve's service port immediately

If the system has been charged with liquid refrigerant while operating the air conditioner, turn off the air conditioner before disconnecting the hose.

6). Mounted the valve stem caps and the service port

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage

8. Operation Characteristics

Temperature / Mode	Cooling operation	Heating operation	Drying operation
Room temperature	≥17℃	≤30℃	＞10℃
Outdoor temperature	-15℃～50℃	-15℃～30℃	-15℃～50℃

CAUTION:

1. If the air conditioner is used beyond the above conditions, certain safety protection features may come into operation and cause the unit to operate abnormally.

2. The room relative humidity should be less than 80%. If the air conditioner operates beyond this figure, the surface of the air conditioner may attract condensation. Please set the vertical air flow louver to its maximum angle (vertically to the floor), and set HIGH fan mode.

3. The optimum performance will be achieved during this operating temperature zone.

9. Electronic function

9.1 Abbreviation

T1: Indoor room temperature(RAT)

T2: Coil temperature of evaporator (ICT)

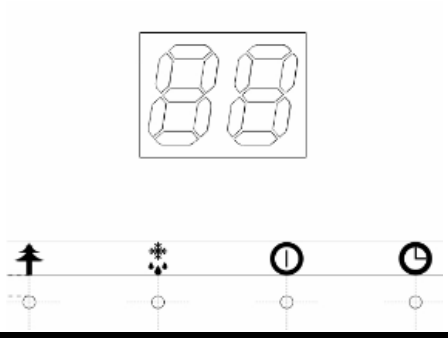
T3: Coil temperature of condenser (OCT)

T4: Outdoor ambient temperature(OAT)

T5: Compressor discharge temperature(CTT)

9.2 Display function

9.2.1 Icon explanation on indoor display board.



2* 7 segments display	1. In normal situation, the setting temperature is displayed. (display room temp. in fan mode.) 2. Shows “SC” when self clean function is activated, ”FP” when 8**ºC** heating function is activated. 3. Shows the alarm code whenever there is an alarm.
ION INDICATOR (optional)	Lights up when ionizer or plasma function is activated.
DEFROSTING INDICATOR	Lights up when the unit is under defrosting operation or when the anti-cold air function is activated.
RUN INDICATOR	Lights up when the unit is in operation.
TIMER INDICATOR	Lights up when TIMER function is activated.

9.3 Main Protection

9.3.1 Time delay at restart for compressor

1 minute delay for the 1st time start-up and 3 minutes delay for others.

9.3.2 Temperature protection of compressor top

The unit will stop working when the compressor top temp. protector cut off, and will restart after the compressor top temp. protector restart.

9.3.3 Temperature protection of compressor discharge

When the compressor discharge temp. is getting higher, the running frequency will be limited as below rules:

---Compressor discharge temp. T5>115℃ for 5s, compressor stops and restarts up till T5<90℃

---110<T5<115℃, decrease the frequency to the lower level every 2 minutes.

---105<T5<110℃, keep running at the current frequency.

----T5<105℃, no limit for frequency.

9.3.4 Fan Speed is out of control

When Indoor Fan Speed keeps too low (300RPM) for certain time, the unit will stop and the LED will display the failure

9.3.5 Inverter module protection

The Inverter module has a protection function about current, voltage and temperature. If these protections happen, the corresponding code will display on indoor unit and the unit will stop working.

9.3.6 Indoor fan delayed open function

When the unit starts up, the louver will be active immediately and the indoor fan will open 10s later.

If the unit runs in heating mode, the indoor fan will be also controlled by anti-cold wind function.

9.3.7 Compressor preheating functions

Preheating permitting condition:

If T4(outdoor ambient temperature)＜3℃ and the machine connects to power supply newly or if T4＜3℃ and compressor has stopped for over 3 hours, the compressor heating cable will work.

Preheating mode:

A weak current flow through the coil of compressor from the wiring terminal of the compressor, then the compressor is heated without operation.

Preheating release condition:

If T4＞5℃ or the compressor starts running, the preheating function will stop.

9.3.8 Sensor protection at open circuit and breaking disconnection.

When there's one temperature sensor in malfunction, the air conditioner will display error code and will not stop immediately, to avoid the case that the air conditioner is in urgent need.

Fault temp. sensor	Operation in cooling, drying and fan only mode	Operation in heating mode
T1	Run supposed T1=26℃ high fan speed	Run supposed T1=26℃ medium fan speed
T2	Normal	During the first 1 minute of compressor operation, indoor fan shuts off. After that, indoor fan runs at medium fan speed for 1 minute and then resume to the setting fan speed.
T3	Run with compressor frequency≤F14	3 minutes' defrosting every 40 minutes when T4<7℃; 2 minutes' defrosting every 90 minutes when T4≥7℃.
T4	Run supposed T4=50℃	Run supposed T4=15℃
TP	Run supposed T4=50℃	Run supposed T4=15℃

9.3.9 Refrigerant leakage detection

This function is only active in cooling mode. It can better prevent the compressor being damaged by refrigerant leakage or compressor overload.

Open condition:

Define the evaporator coil temp.T2 of the compressor just starts running as Tcool.

In the beginning 5 minutes after the compressor starts up, if T2 ＜Tcool－2℃ does not keep continuous 4 seconds and this situation happens 3 times, the display area will show "EC" and AC will turn off.

9.3.10 Zero crossing detection error protection(only for AWSI-HKD009-N11)

If AC detects time interval is not correct for continuous 240s, the unit will stop and the LED will display the failure. The correct zero crossing signal time interval should be between 6-13ms.

9.4 Operation Modes and Functions

9.4.1 Fan mode

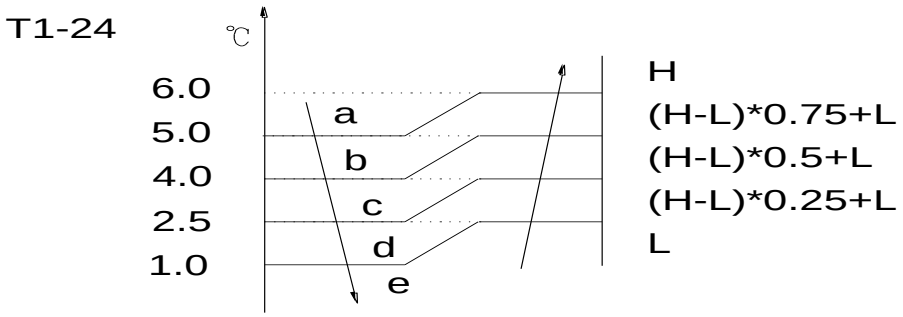
(1) Outdoor fan and compressor stop.

(2) Temperature setting function is disabled, and no setting temperature is displayed.

(3) Indoor fan can be set to high/med/low/auto.

(4) The louver operates same as in cooling mode.

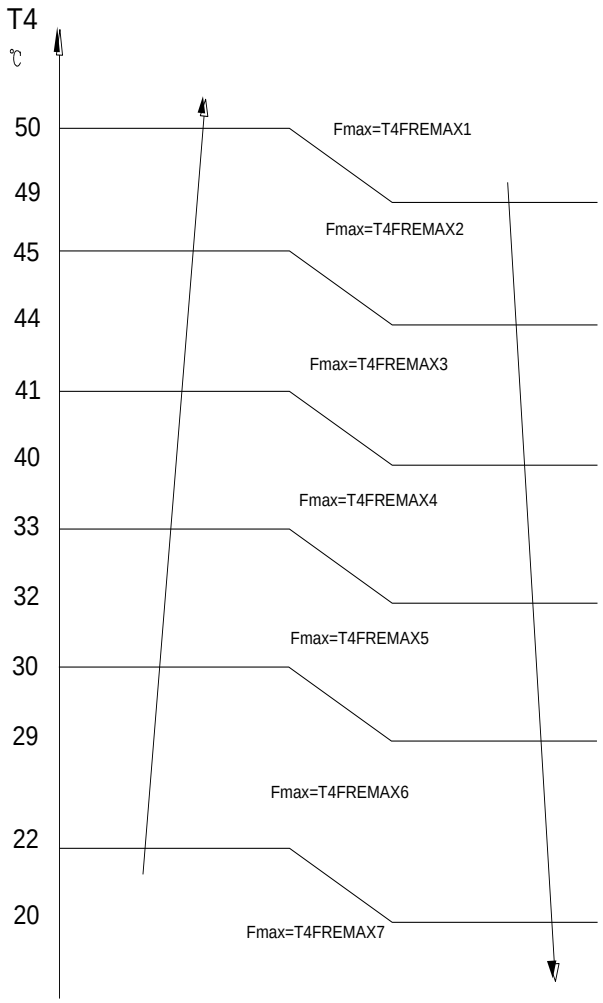
(5) Auto fan:



9.4.2 Cooling Mode

9.4.2.1 Compressor running rules

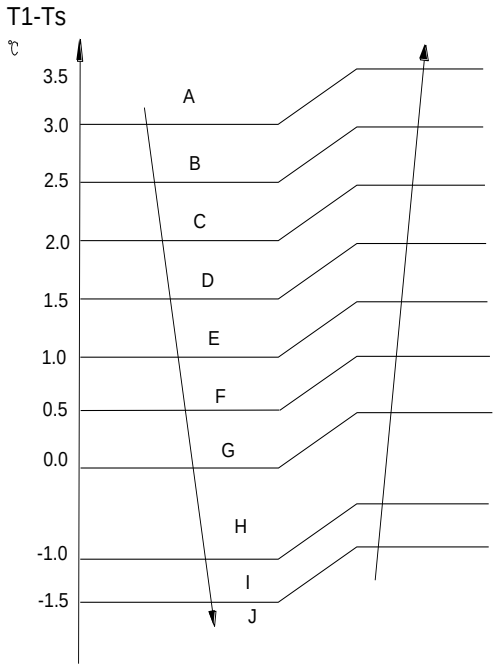
The maximum operation frequency of compressor after starting submits to following rule.



Meanwhile, the maximum frequency is limited by the indoor fan speed.

Indoor fan speed	Maximum frequency
High speed / turbo function	No limit
Silent mode	Fixed at F3

If users switch on AC by remote controller, the compressor will run at the Fmax frequency for 7 minutes according to the outdoor ambient temp. During the 7 minutes, the frequency limitation is active. 7 minutes later, the compressor running frequency will be controlled as below:



While the zones of A,B,C... are corresponding to different compressor running frequency.

Note:

When T1-Ts keeps in the same temp. zone for 3 minutes, the compressor will run as the below rules:

A:Increase the frequency to 3 grade higher until to FREMAX.

B~E: Increase the frequency to 2 grade higher until to FREMAX.

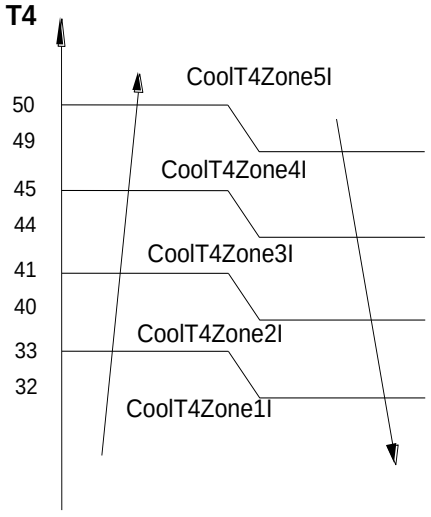
F~G: Increase the frequency to 1 grade higher until to FREMAX.

H: Keep the current frequency. :

I: Decrease the frequency to 1 grade lower until to F1.

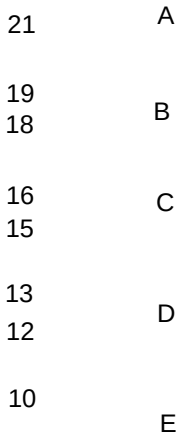
J: Run at F1 for 1h.(if T1-Ts<-2℃, the compressor will stop)

Meanwhile, the compressor running frequency is limited by the current.

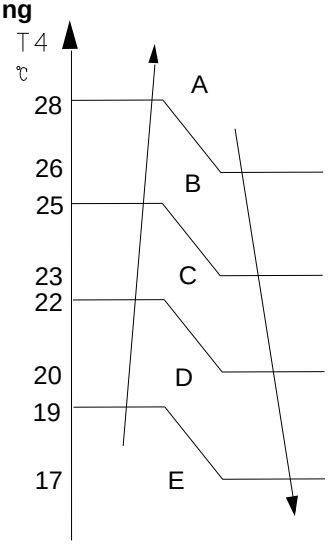


9.4.2.2 Outdoor fan running rules

Heating



Cooling



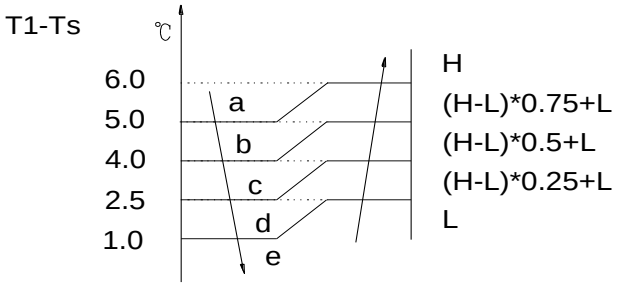
While A,B,C…means different fan speed of outdoor unit.

9.4.2.3 Indoor fan running rules

In cooling mode, indoor fan runs all the time and the speed can be selected as high, medium, low, auto and silent. When the compressor is running, the indoor fan is controlled as below:

Setting Fan speed	T1-Ts		Actual fan speed
H	4.5 3.0 1.5	A B C	H+(H+=H+G) H（=H） H-（H-=H-G）
M	4.5 3.0 1.5	D E F	M+(M+=M+Z) M(M=M) M-(M-=M-Z)
L	4.5 3.0 1.5	G H I	L+(L+=L+D) L(L=L) L-(L-=L-D)

The auto fan acts as below rules:



9.4.2.4 Condenser temperature protection

---55℃<T3<60℃, the compressor frequency will decrease to the lower level until to F1 and then runs at F1.If T3<54℃, the compressor will keep running at the current frequency.

---T3<52℃, the compressor will not limit the frequency and resume to the former frequency.

---T3>60℃ for 5 seconds, the compressor will stop until T3<52℃.

9.4.2.5 Evaporator temperature protection

---T2<0℃, the compressor will stop and restart when T2>=5℃.

---0℃≦T2<4℃, the compressor frequency will be limited and decreased to the lower level

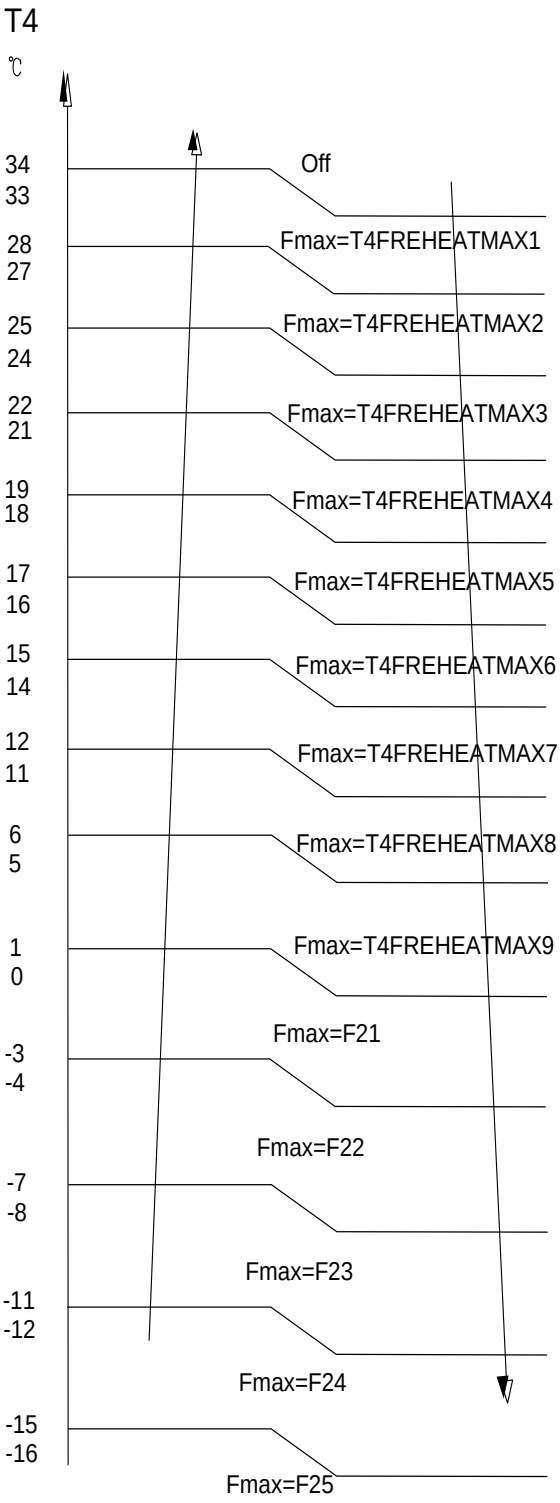
---4℃≤T2≤7℃, the compressor will keep the current frequency.

---T2>7℃, the compressor frequency will not be limited.

9.4.3 Heating Mode

9.4.3.1 Compressor running rules

The maximum operation frequency of the compressor after starting submits to the following rule.

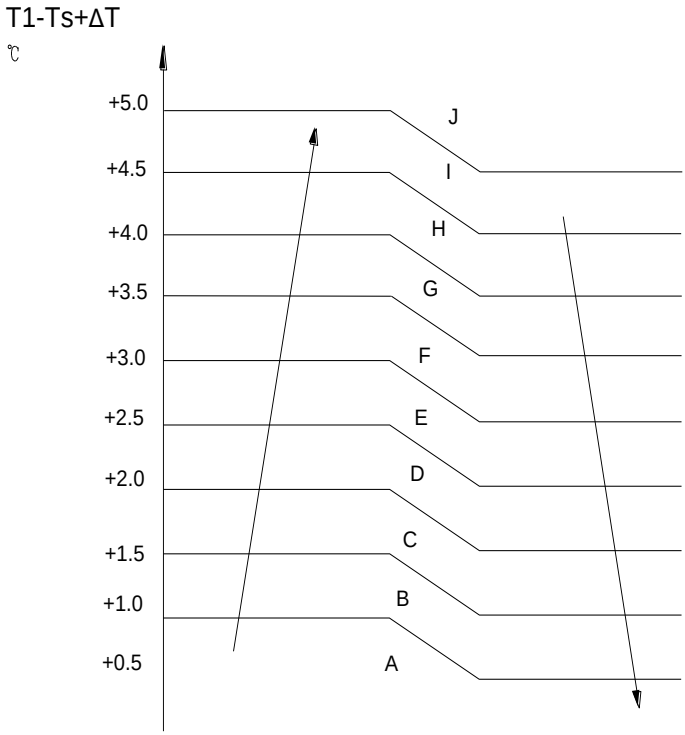


Meanwhile, the maximum frequency is limited by the indoor fan speed.

Indoor fan speed	Maximum frequency
High speed/8 degree heating/ turbo function	No limit
Medium speed	FHeatMaxMidFan
Low speed/sleep mode	FHeatMaxLowFan
Silent mode	Fixed at F3

If users switch on AC by remote controller, the compressor will run at the Fmax frequency for 7 minutes according to outdoor ambient temp. During the 7 minutes, the frequency limitation is active.

7 minutes later, the compressor running frequency will be controlled as below:



While the zones of A,B,C... are corresponding to different compressor running frequency.

ΔT=0℃ as default.

Note:

When T1-Ts keeps in the same temp. zone for 3 minutes, the compressor will run as the below rules:

A: Increase the frequency to 3 grade higher until to FREMAX.

B~E: Increase the frequency to 2 grade higher until to FREMAX.

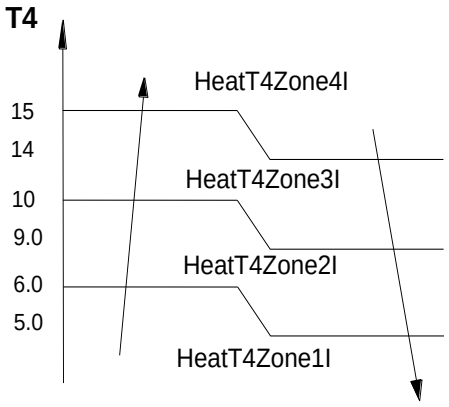
F~G: Increase the frequency to 1 grade higher until to FREMAX.

H: Keep the current frequency.

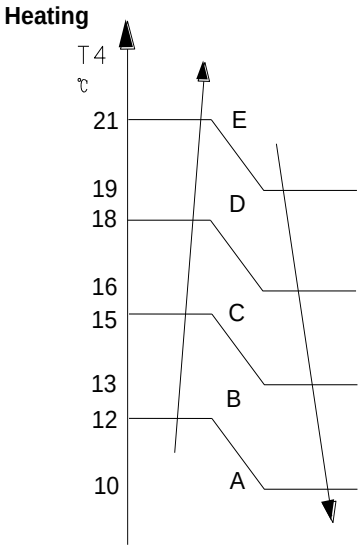
I: Decrease the frequency to the 1 grade lower until to F1.

J: Run at F1 for 1h.(if T1-Ts-ΔT >6℃, the compressor will stop)

Meanwhile, the compressor running frequency is limited by the current.



9.4.3.2 Outdoor fan running rules



9.4.3.3 Indoor fan running rules

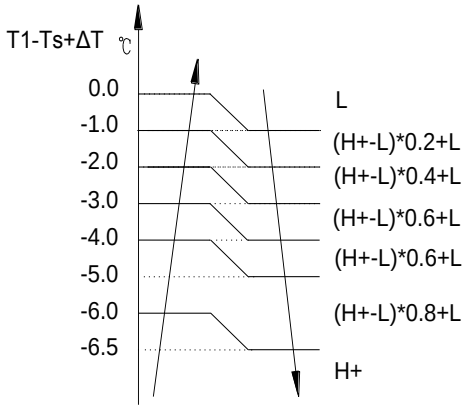
In heating mode, indoor fan can be selected as high, medium, low, auto and silent. The anti-cold- wind function is preferential. The running rules of anti-cold-wind function depend on both T1 and T2 that is more comfortable control.

When the compressor is running, the indoor fan is controlled as below:

Setting fan speed	T1-Ts	Actual fan speed
H	-1.5 / -3.0 / -4.5	H-（H-=H-G）
		H（=H）
		H+(H+=H+G)
M	-1.5 / -3.0 / -4.5	M-(M-=M-Z)
		M(M=M)
		M+(M+=M+Z)
L	-1.5 / -3.0 / -4.5	L-(L-=L-D)
		L(L=L)
		L+(L+=L+D)

If the compressor stops caused by the room temperature rising, the indoor fan will be forced to run 127 seconds with breeze. During this period, the anti-cold-wind is disabled.

Auto fan action in heating mode:



9.4.3.4 Defrosting mode

Condition of defrosting:

If any one of the following items is satisfied, AC will enter the defrosting mode.

After the compressor starts up and keeps running, mark the minimum value of T3 from the 10th minutes to 15th minutes as T30.

1)If the compressor cumulate running time is up to 29 minutes and T3< TCDI1, T3 + T30SUBT3ONE≦T30.

2)If the compressor cumulate running time is up to 35 minutes and T3< TCDI2, T3 + T30SUBT3TWO≦T30.

3)If the compressor cumulate running time is up to 29 minutes and T3< TCDI3 for 3 minutes.

4)If the compressor cumulate running time is up to 120 minutes and T3<-15℃.

Condition of ending defrosting:

If any one of the following items is satisfied, the defrosting will finish and the machine will turn to normal heating mode.

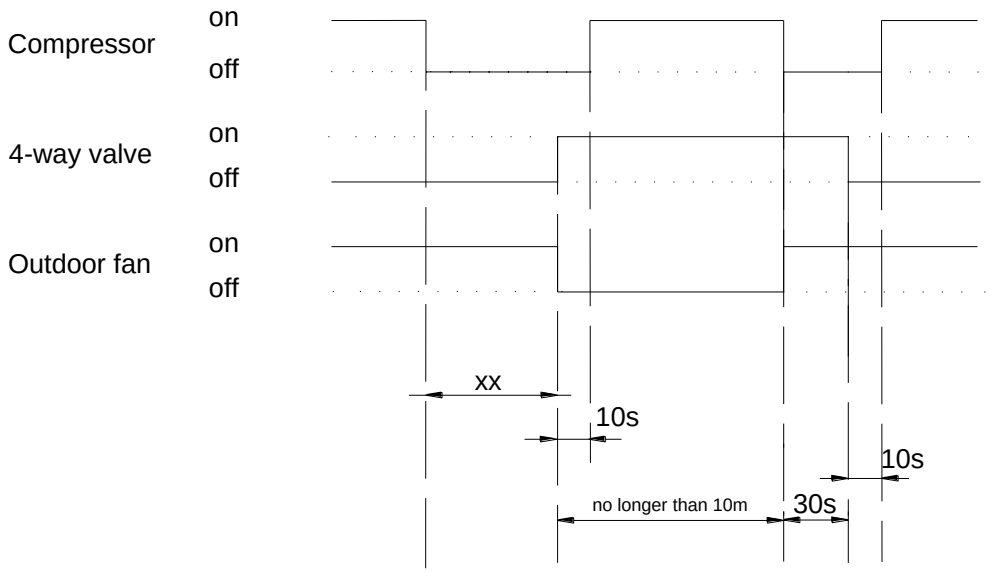
----T3 rises to be higher than TCDE1℃.

----T3 keeps to be higher than TCDE2℃ for 80 seconds.

----The machine has run for 10 minutes in defrosting mode.

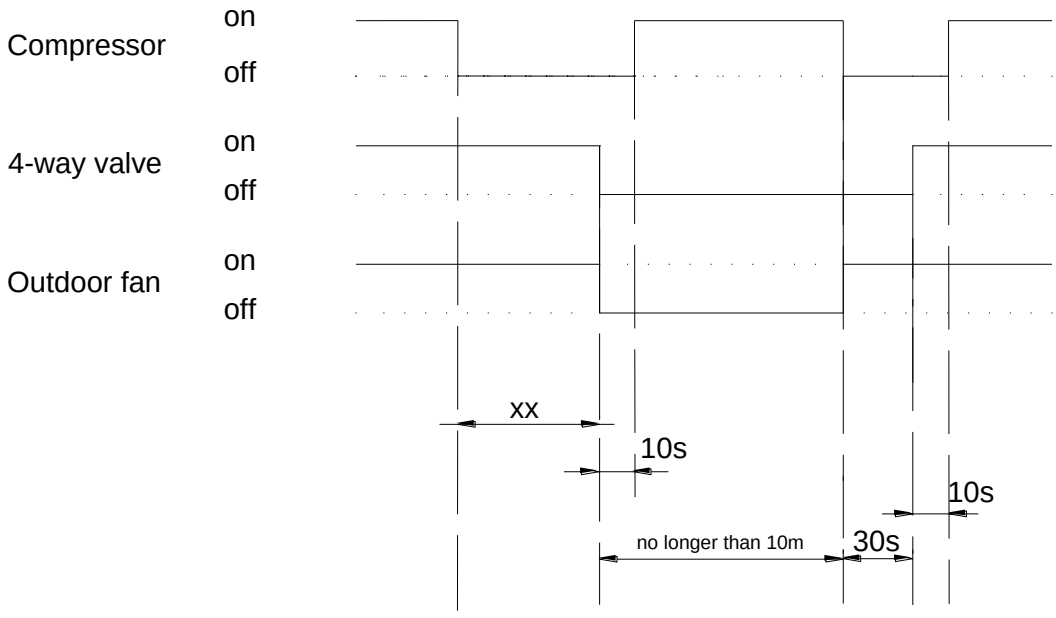
Defrosting action：

For 9k,12k models:



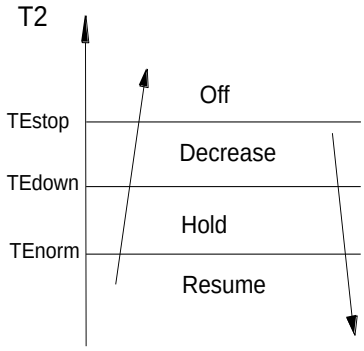
xx=20.

For 18k,24k models:



xx=20

9.4.3.5 Evaporator coil temperature protection



Off: Compressor stops.

Decrease: Decrease the running frequency to the lower level.

Hold: Keep the current frequency.

Resume: No limitation for frequency.

9.4.4 Auto-mode

This mode can be chosen with remote controller and the setting temperature can be changed between 17~30℃.

In auto mode, the machine will choose cooling, heating or fan-only mode according to ΔT (ΔT =T1-Ts).

ΔT=T1-Ts	Running mode
ΔT＞1℃	Cooling
-1<ΔT≤1℃	Fan-only
ΔT≤-1℃	Heating

Indoor fan will run at auto fan of the relevant mode.

The louver operates same as in relevant mode.

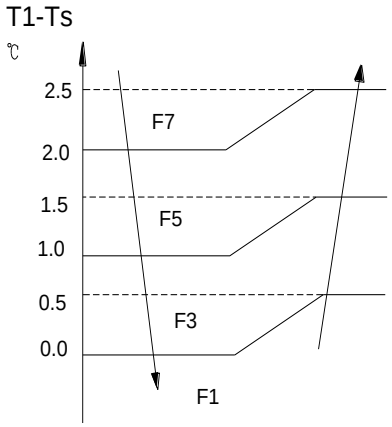
If the machine switches mode between heating and cooling, the compressor will keep stopping for 15 minutes and then choose mode according to T1-Ts.

If the setting temperature is modified, the machine will choose running function again.

9.4.5 Drying mode

9.4.5.1 Indoor fan speed is fixed at breeze and can't be changed. The louver angle is the same as in cooling mode.

9.4.5.2 Compressor running rules



9.4.5.3 Low indoor room temperature protection

In drying mode, if room temperature is lower than 10℃, the compressor will stop and not resume until room temperature exceeds 12℃.

9.4.5.4 Evaporator anti-freezing protection, condenser high temperature protection and outdoor unit frequency limit are active and the same as that in cooling mode.

9.4.5.5 The outdoor fan operates the same as in cooling mode.

9.4.6 Forced operation function

9.4.6.1 Enter forced operation function:

When the machine is off, pressing the touch button will carry the machine to forced auto mode. If pressing the button once again within 5 seconds, the machine will turn into forced cooling mode.

In forced auto, forced cooling or any other operation mode, pressing touch button will turn off the machine.

9.4.6.2 In forced operation mode, all general protections and remote control are available.

9.4.6.3 Operation rules:

Forced cooling mode:

The compressor runs at F2 frequency and indoor fan runs as breeze. After running for 30 minutes. the machine will turn to auto mode as 24℃ setting temperature.

Forced auto mode:

The action of forced auto mode is the same as normal auto mode with 24℃ setting temperature.

9.4.7 Timer function

9.4.7.1 Timing range is 24 hours.

9.4.7.2 Timer on. The machine will turn on automatically when reaching the setting time.

9.4.7.3 Timer off. The machine will turn off automatically when reaching the setting time.

9.4.7.4 Timer on/off. The machine will turn on automatically when reaching the setting “on” time, and then turn off automatically when reaching the setting “off” time.

9.4.7.5 Timer off/on. The machine will turn off automatically when reaching the setting “off” time, and then turn on automatically when reaching the setting “on” time.

9.4.7.6 The timer function will not change the AC current operation mode. Suppose AC is off now, it will not start up firstly after setting the “timer off” function. And when reaching the setting time, the timer LED will be off and the AC running mode has not been changed.

9.4.7.7 The setting time is relative time.

9.4.8 Sleep function mode

9.4.8.1 Operation time in sleep mode is 7 hours. After 7 hours the AC quits this mode and turns off.

9.4.8.2. Operation process in sleep mode is as follow:

When cooling, the setting temperature rises 1℃ (be lower than 30℃) every one hour, 2 hours later the setting temperature stops rising and indoor fan is fixed as low speed.

When heating, the setting temperature decreases 1℃ (be higher than 17℃) every one hour, 2 hours later the setting temperature stops rising and indoor fan is fixed as low speed. (Anti-cold wind function has the priority)

9.4.8.3 Timer setting is available

9.4.8.4 When user uses timer off function in sleep mode (or sleep function in timer off mode), if the timing is less than 7 hours, sleep function will be cancelled when reaching the setting time. If the timing is more than 7 hours, the machine will not stop until reaches the setting time in sleep mode.

9.4.9 Auto-Restart function

The indoor unit is equipped with auto-restart function, which is carried out through an auto-restart module. In case of a sudden power failure, the module memorizes the setting conditions before the power failure. The unit will resume the previous operation setting (not including swing function) automatically after 3 minutes when power returns.

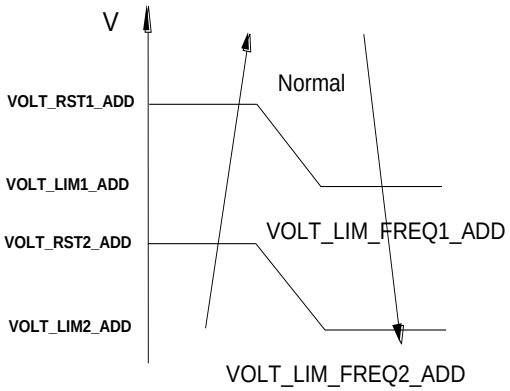
If the memorization condition is forced cooling mode, the unit will run in cooling mode for 30 minutes

and turn to auto mode as 24℃ setting temp.
If AC is off before power off and AC is required to start up now, the compressor will have 1 minute delay when power on. Other conditions, the compressor will have 3 minutes delay when restarts.

9.4.10 8℃ Heating

In heating operation, the preset temperature of the air conditioner can be as lower as 8℃, which keeps the room temperature steady at 8℃ and prevents household things freezing when the house is unoccupied for a long time in severe cold weather.

9.4.11 Frequency limitation protection



The PCB will detect the voltage of power supply and adjust the compressor running frequency to protect the system.
In the first 10 seconds after power on, this protection is inactive.
When this protection happens, it will last 3 minutes and then the PCB will detect the power supply voltage again.

10. Troubleshooting

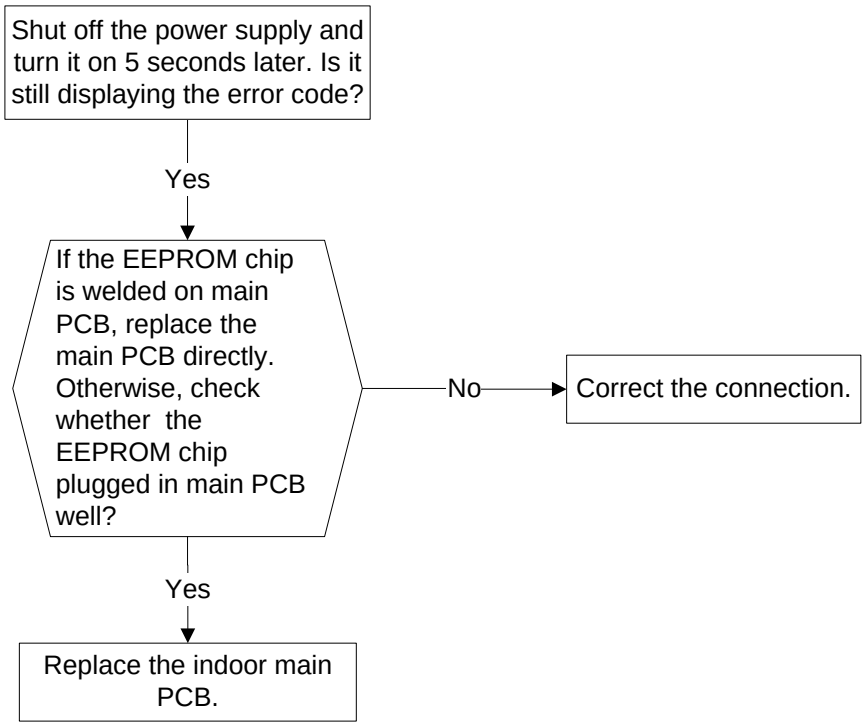
10.1 Indoor Unit Error Display

Operation lamp	Timer lamp	Display	LED STATUS
☆ 1 time	X	E0	Indoor unit EEPROM parameter error
☆ 2 times	X	E1	Indoor / outdoor units communication error
☆ 3 times	X	E2	Zero crossing signal detection error(only for AWSI-HKD009-N11)
☆ 4 times	X	E3	Indoor fan speed has been out of control
☆ 5 times	X	E4	Open circuit or short circuit of indoor room temperature T1 sensor
☆ 6 times	X	E5	Open circuit or short circuit of evaporator coil temperature T2 sensor
☆ 7 times	X	EC	Refrigerant Leakage Detection
☆ 2 times	O	F1	Open circuit or short circuit of outdoor ambient T4 temperature sensor
☆ 3 times	O	F2	Open circuit or short circuit of condenser coil temperature T3 sensor
☆ 4 times	O	F3	Open circuit or short circuit of compressor discharge T5 temperature sensor
☆ 5 times	O	F4	Outdoor unit EEPROM parameter error
☆ 6 times	O	F5	Outdoor fan speed has been out of control
☆ 1 times	☆	P0	IPM malfunction or IGBT over-strong current protection
☆ 2 times	☆	P1	Over voltage or over low voltage protection
☆ 3 times	☆	P2	High temperature protection of compressor top diagnosis and solution(Only for AWSI-HKD024-N11 models)
☆ 5 times	☆	P4	Inverter compressor drive error

O（light） X（off） ☆（flash）

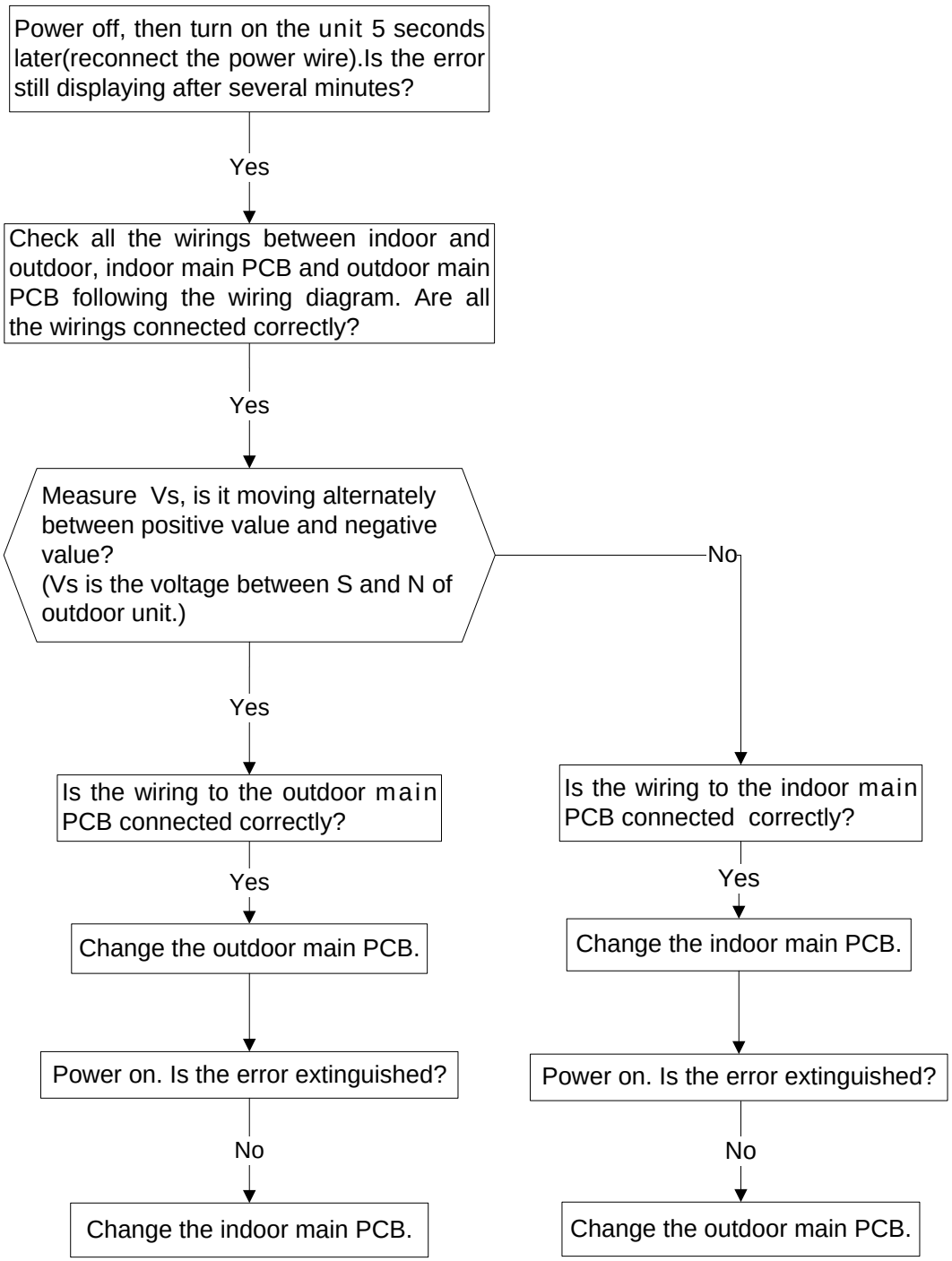
10.2 Diagnosis and Solution

10.2.1 EEPROM parameter error diagnosis and solution(E0)

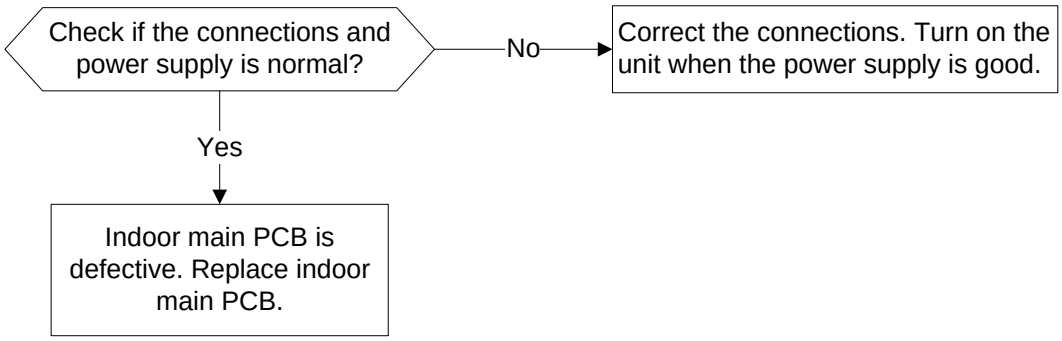

Shut off the power supply and turn it on 5 seconds later. Is it still displaying the error code?
Yes
If the EEPROM chip is welded on main PCB, replace the main PCB directly. Otherwise, check whether the EEPROM chip plugged in main PCB well?
No
Correct the connection.
Yes
Replace the indoor main PCB.

EEPROM: a read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.

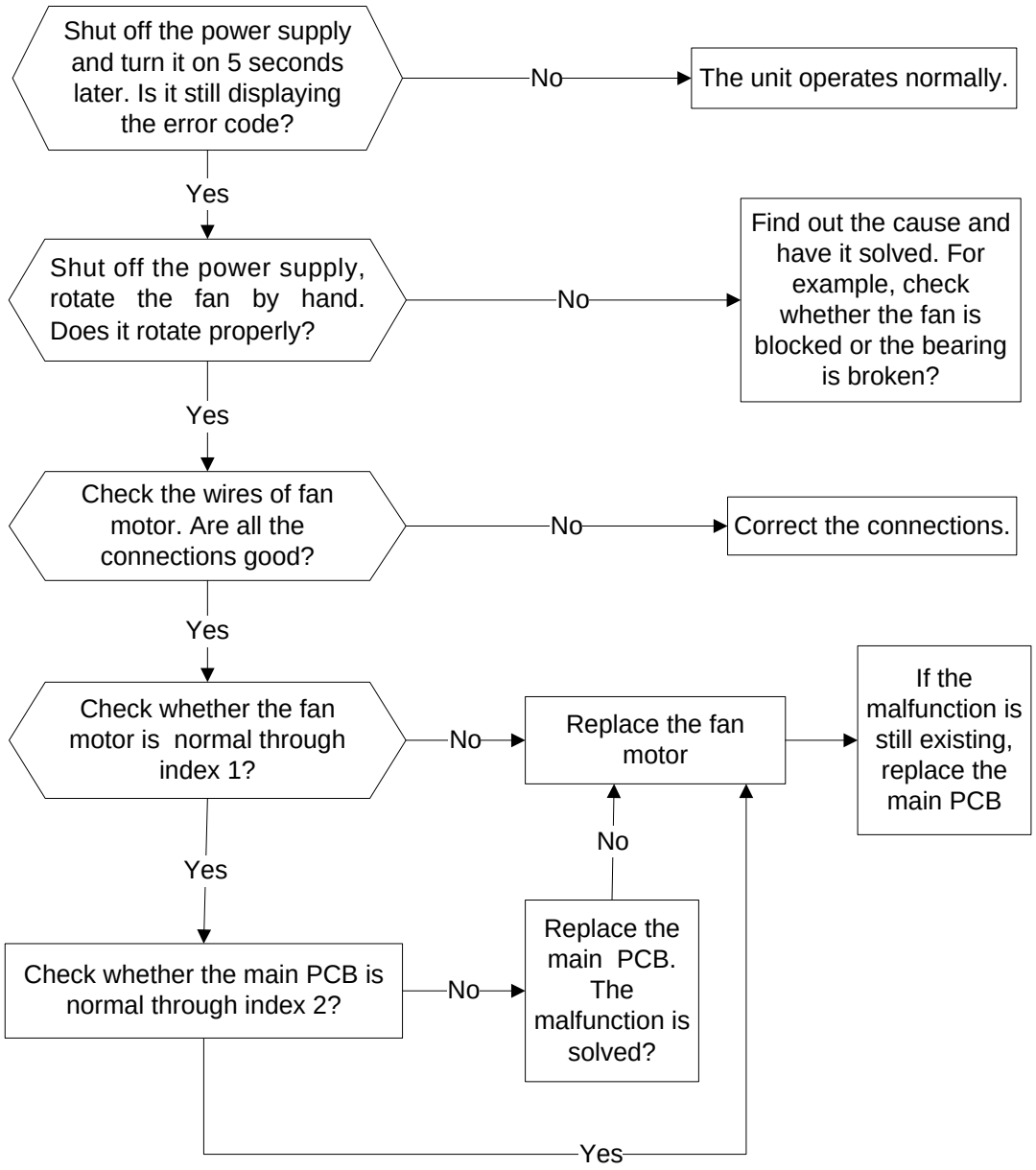
10.2.2 Indoor unit and outdoor unit communication protection error diagnosis and solution (E1)


Power off, then turn on the unit 5 seconds later(reconnect the power wire).Is the error still displaying after several minutes?
Yes
Check all the wirings between indoor and outdoor, indoor main PCB and outdoor main PCB following the wiring diagram. Are all the wirings connected correctly?
Yes
Measure Vs, is it moving alternately between positive value and negative value?
(Vs is the voltage between S and N of outdoor unit.)
No
Yes
Is the wiring to the outdoor main PCB connected correctly?
Yes
Change the outdoor main PCB.
Power on. Is the error extinguished?
No
Change the indoor main PCB.
Is the wiring to the indoor main PCB connected correctly?
Yes
Change the indoor main PCB.
Power on. Is the error extinguished?
No
Change the outdoor main PCB.

10.2.3 Zero crossing detection error diagnosis and solution(E2)


Check if the connections and power supply is normal?
No
Correct the connections. Turn on the unit when the power supply is good.
Yes
Indoor main PCB is defective. Replace indoor main PCB.

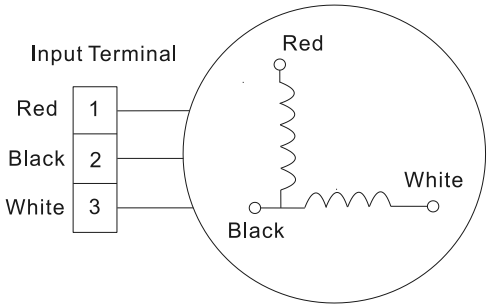
10.2.4 Fan speed has been out of control diagnosis and solution (E3/F5)


Shut off the power supply and turn it on 5 seconds later. Is it still displaying the error code?
No
The unit operates normally.
Yes
Shut off the power supply, rotate the fan by hand. Does it rotate properly?
No
Find out the cause and have it solved. For example, check whether the fan is blocked or the bearing is broken?
Yes
Check the wires of fan motor. Are all the connections good?
No
Correct the connections.
Yes
Check whether the fan motor is normal through index 1?
No
Replace the fan motor
If the malfunction is still existing, replace the main PCB
Yes
No
Check whether the main PCB is normal through index 2?
No
Replace the main PCB. The malfunction is solved?
Yes

Index 1:

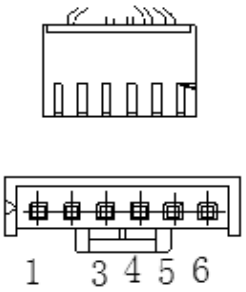
1. Indoor AC Fan Motor

Measure the resistance value of each winding by using the tester.



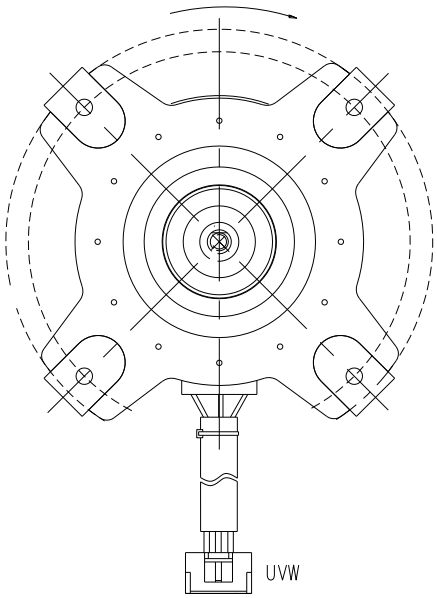
2.Outdoor or indoor DC Fan Motor (control chip is in fan motor)

Measure the resistance value of each winding by using the tester. If any resistance value is zero, the fan motor must have problems and need to be replaced.



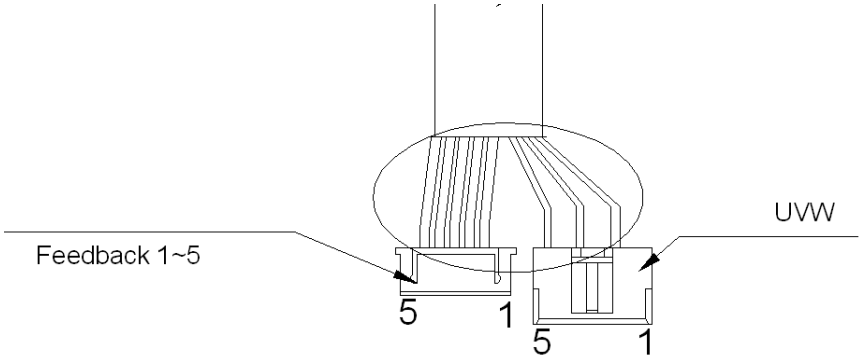
3. Outdoor or indoor DC Fan Motor (control chip is in on PCB)

For WZDK36-38G-W



1) Release the UVW connector. Measure the resistance of U-V, U-W, V-W. If the resistance is not equal to each other, the fan motor must has problems and need to be replaced. Otherwise, go to step 2.

For other motors:



NO.	1	2	3	4	5
Color	Orange	Grey	White	Pink	Black
Signal	Hu	Hv	Hw	Vcc	GND

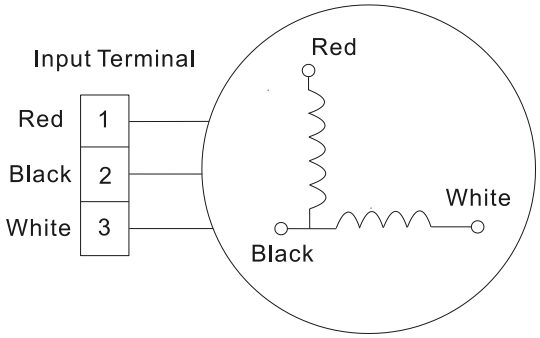
Color	Red	Blue	Yellow
Signal	W	V	U

1) Release the UVW connector. Measure the resistance of U-V, U-W, V-W. If the resistance is not equal to each other, the fan motor must has problems and need to be replaced. Otherwise, go to step 2.
2) Power on and when the unit is in standby, measure the voltage of pin4-5 in feedback signal connector. If the value is not 5V, change the PCB. Otherwise, go to step 3.
3) Rotate the fan by hand, measure the voltage of pin1-5, pin 2-5 and pin 3-5 in feedback signal connector. If any voltage is not positive voltage fluctuation, the fan motor must has problems and need to be replaced.

Index2:

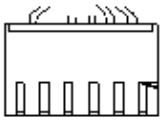
1: Indoor AC Fan Motor

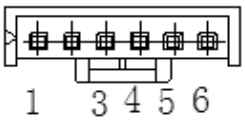
Power on and set the unit running in fan mode at high fan speed. After running for 15 seconds, measure the voltage of pin1 and pin2. If the value of the voltage is less than 100V(208~240V power supply)or 50V(115V power supply), the PCB must has problems and need to be replaced.



2. Indoor or Outdoor DC Fan Motor(control chip is in fan motor)

Power on and when the unit is in standby, measure the voltage of pin1-pin3, pin4-pin3 in fan motor connector. If the value of the voltage is not in the range showing in below table, the PCB must has problems and need to be replaced.



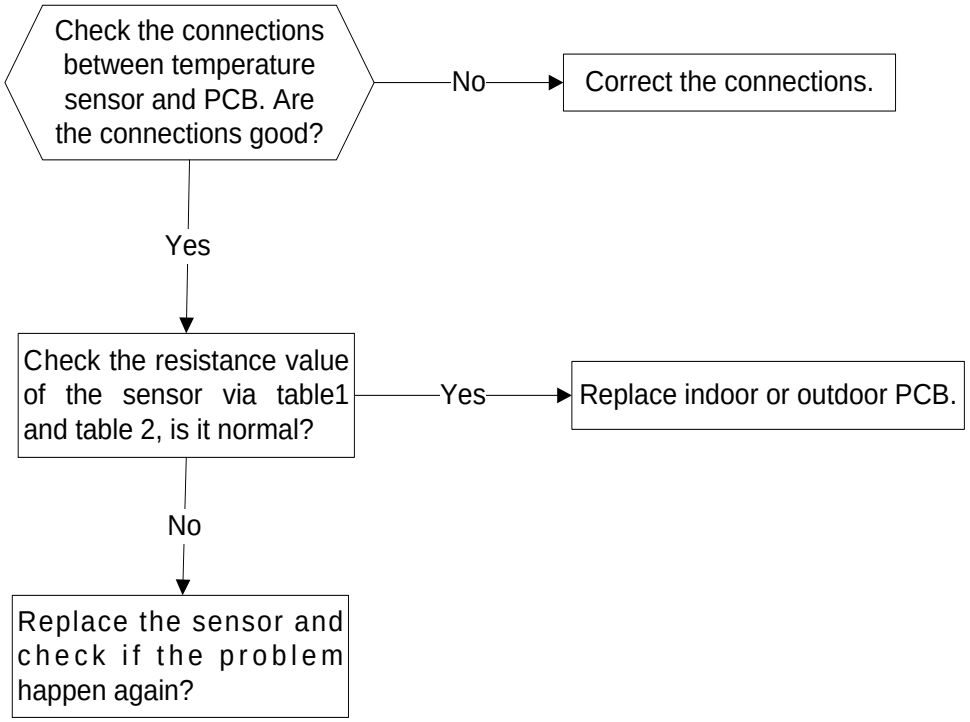


DC motor voltage input and output

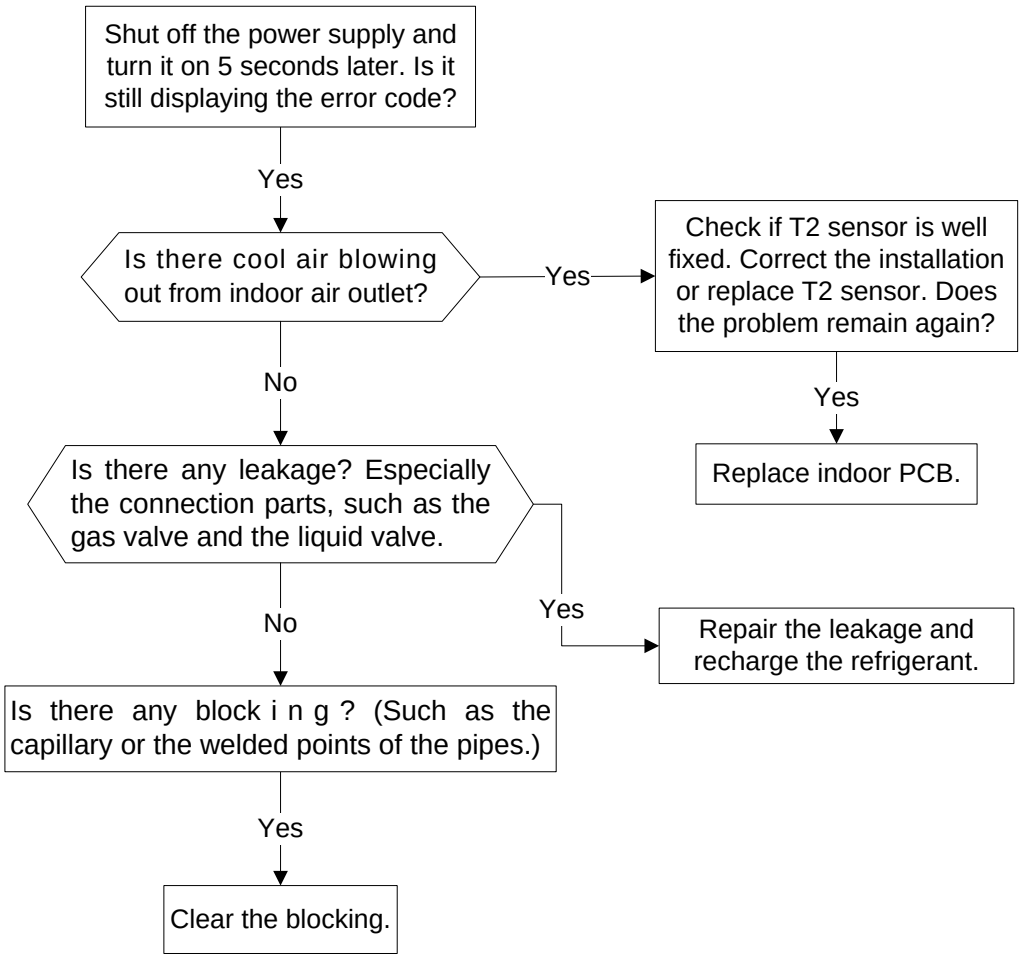
NO.	Color	Signal	Voltage
1	Red	Vs/Vm	280V~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	14-17.5V
5	Yellow	Vsp	0~5.6V
6	Blue	FG	14-17.5V

10.2.5 Open circuit or short circuit of temperature sensor diagnosis and solution

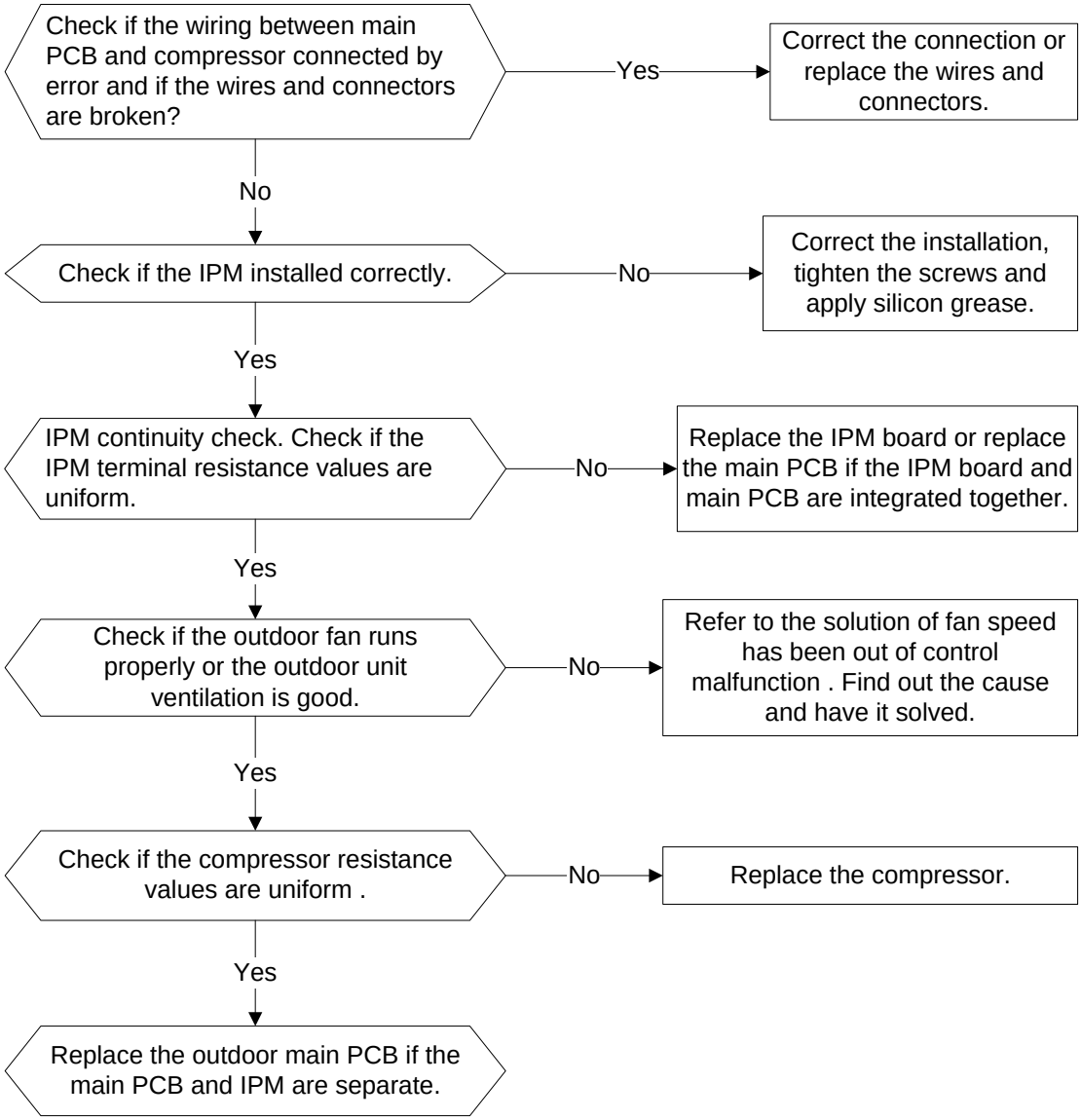
(E4/E5/F1/F2/F3)


Check the connections between temperature sensor and PCB. Are the connections good?
No
Correct the connections.
Yes
Check the resistance value of the sensor via table1 and table 2, is it normal?
Yes
Replace indoor or outdoor PCB.
No
Replace the sensor and check if the problem happen again?

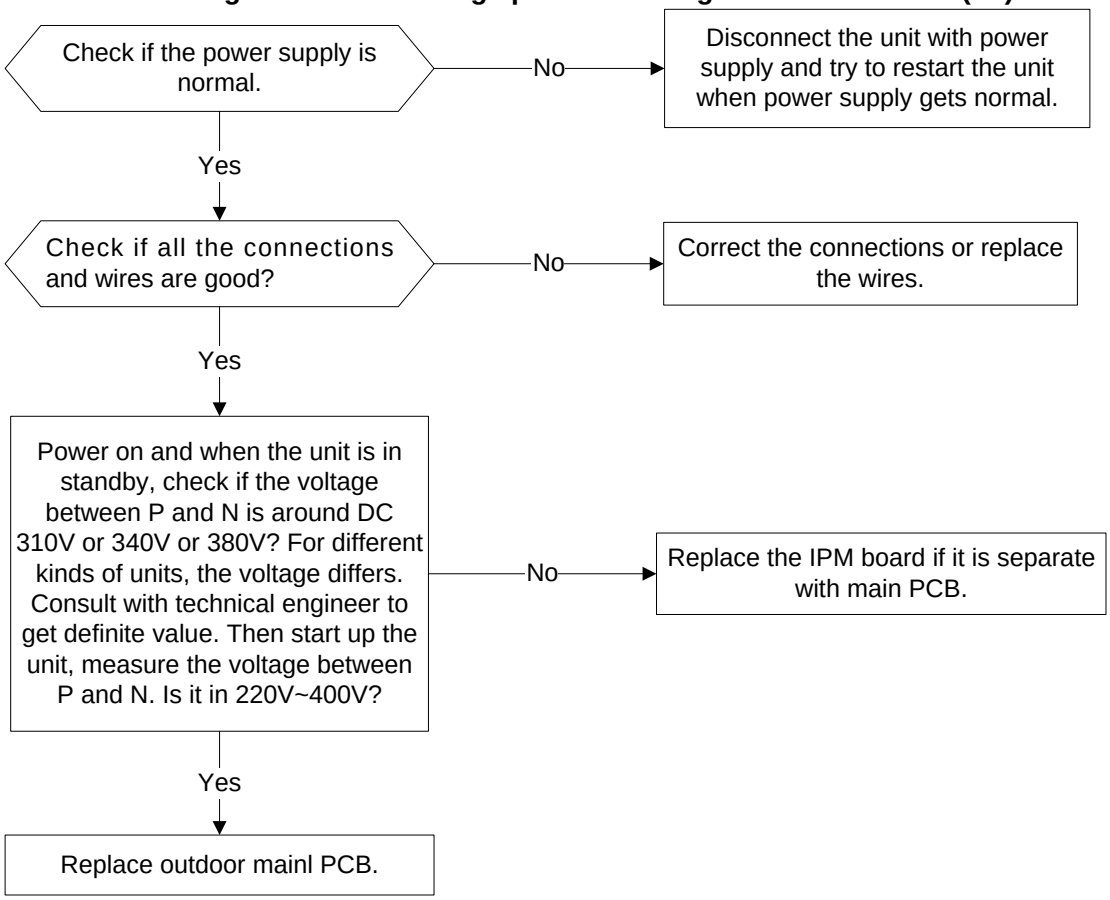
10.2.6 Refrigerant Leakage Detection diagnosis and solution (EC)


Shut off the power supply and turn it on 5 seconds later. Is it still displaying the error code?
Yes
Is there cool air blowing out from indoor air outlet?
Yes
Check if T2 sensor is well fixed. Correct the installation or replace T2 sensor. Does the problem remain again?
Yes
Replace indoor PCB.
No
Is there any leakage? Especially the connection parts, such as the gas valve and the liquid valve.
Yes
Repair the leakage and recharge the refrigerant.
No
Is there any block i n g ? (Such as the capillary or the welded points of the pipes.)
Yes
Clear the blocking.

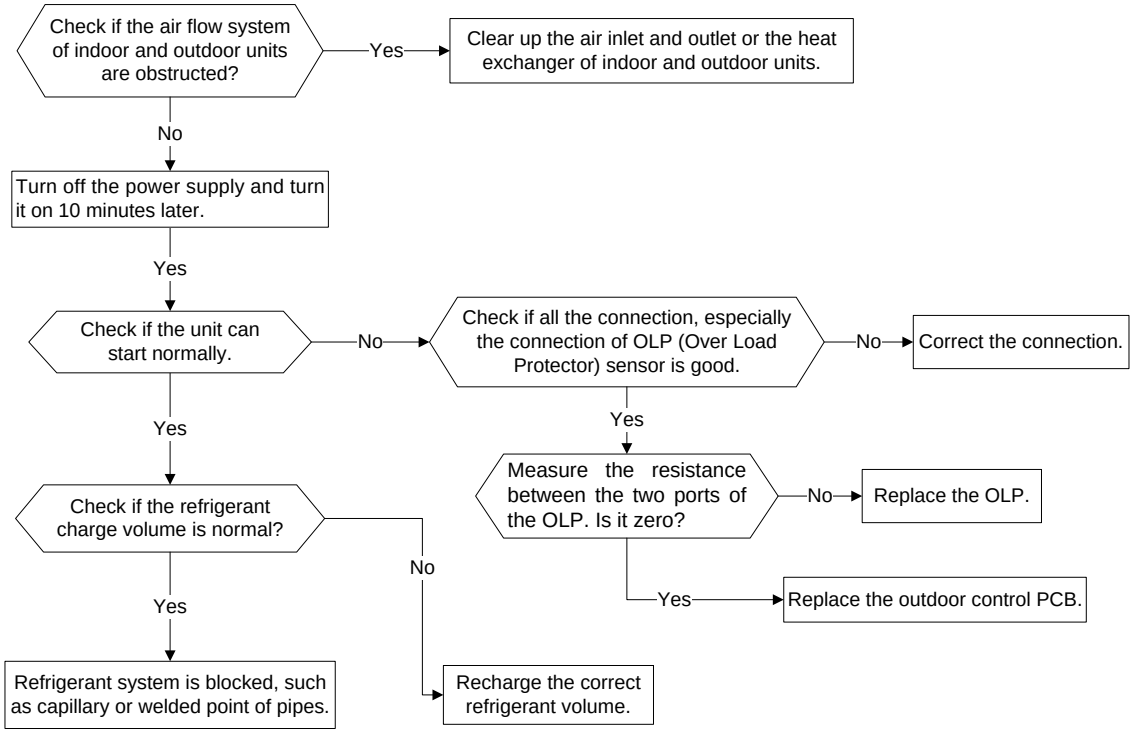
10.2.7 IPM malfunction or IGBT over-strong current protection diagnosis and solution(P0)


Check if the wiring between main PCB and compressor connected by error and if the wires and connectors are broken?
Yes
Correct the connection or replace the wires and connectors.
No
Check if the IPM installed correctly.
No
Correct the installation, tighten the screws and apply silicon grease.
Yes
IPM continuity check. Check if the IPM terminal resistance values are uniform.
No
Replace the IPM board or replace the main PCB if the IPM board and main PCB are integrated together.
Yes
Check if the outdoor fan runs properly or the outdoor unit ventilation is good.
No
Refer to the solution of fan speed has been out of control malfunction . Find out the cause and have it solved.
Yes
Check if the compressor resistance values are uniform .
No
Replace the compressor.
Yes
Replace the outdoor main PCB if the main PCB and IPM are separate.

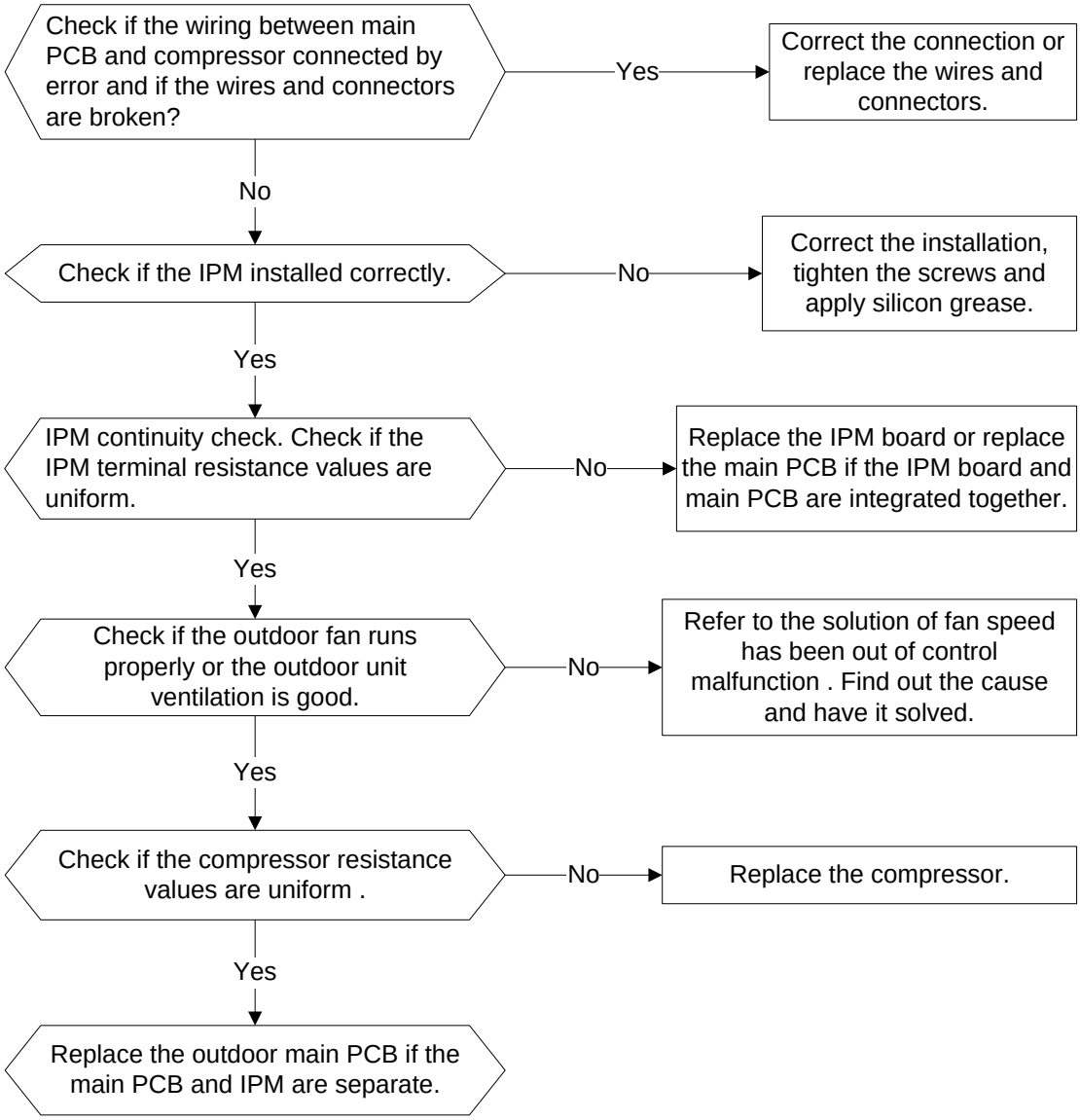
10.2.8 Over voltage or too low voltage protection diagnosis and solution(P1)


Check if the power supply is normal.
No
Disconnect the unit with power supply and try to restart the unit when power supply gets normal.
Yes
Check if all the connections and wires are good?
No
Correct the connections or replace the wires.
Yes
Power on and when the unit is in standby, check if the voltage between P and N is around DC 310V or 340V or 380V? For different kinds of units, the voltage differs. Consult with technical engineer to get definite value. Then start up the unit, measure the voltage between P and N. Is it in 220V~400V?
No
Replace the IPM board if it is separate with main PCB.
Yes
Replace outdoor mainl PCB.

10.2.9 High temperature protection of compressor top diagnosis and solution(P2)

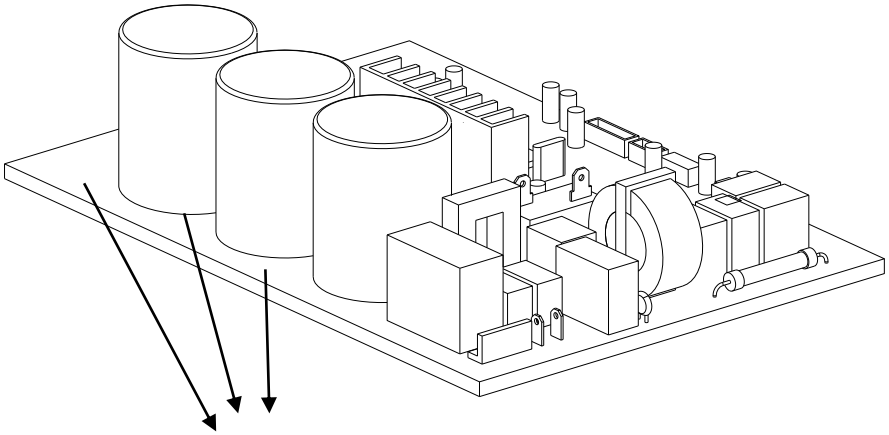

Check if the air flow system of indoor and outdoor units are obstructed?
Yes
Clear up the air inlet and outlet or the heat exchanger of indoor and outdoor units.
No
Turn off the power supply and turn it on 10 minutes later.
Yes
Check if the unit can start normally.
No
Check if all the connection, especially the connection of OLP (Over Load Protector) sensor is good.
No
Correct the connection.
Yes
Measure the resistance between the two ports of the OLP. Is it zero?
No
Replace the OLP.
Yes
Replace the outdoor control PCB.
Yes
Check if the refrigerant charge volume is normal?
No
Yes
Refrigerant system is blocked, such as capillary or welded point of pipes.
Recharge the correct refrigerant volume.

10.2.10 Inverter compressor drive error diagnosis and solution(P4)


Check if the wiring between main PCB and compressor connected by error and if the wires and connectors are broken?
Yes
Correct the connection or replace the wires and connectors.
No
Check if the IPM installed correctly.
No
Correct the installation, tighten the screws and apply silicon grease.
Yes
IPM continuity check. Check if the IPM terminal resistance values are uniform.
No
Replace the IPM board or replace the main PCB if the IPM board and main PCB are integrated together.
Yes
Check if the outdoor fan runs properly or the outdoor unit ventilation is good.
No
Refer to the solution of fan speed has been out of control malfunction . Find out the cause and have it solved.
Yes
Check if the compressor resistance values are uniform .
No
Replace the compressor.
Yes
Replace the outdoor main PCB if the main PCB and IPM are separate.

Safety

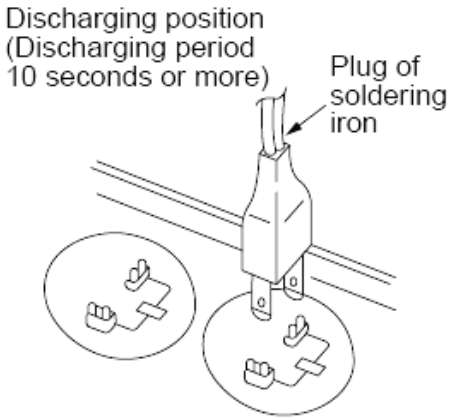
Electricity power is still kept in capacitors even the power supply is shut off. Do not forget to discharge the electricity power in capacitor.



Electrolytic Capacitors

(HIGH VOLTAGE! CAUTION!)

Connect discharge resistance (approx.100Ω 40W) or soldering iron (plug) between +, - terminals of the electrolytic capacitor on the contrary side of the outdoor PCB.

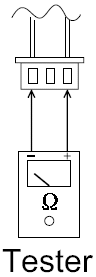


Note: The picture above is only for reference. The plug of your side may be different.

Main parts check

1. Temperature sensor checking

   Disconnect the temperature sensor from PCB, measure the resistance value with a tester.



Tester

Temperature Sensors.

Room temp.(T1) sensor,

Indoor coil temp.(T2) sensor,

Outdoor coil temp.(T3) sensor,

Outdoor ambient temp.(T4) sensor,

Compressor discharge temp.(T5) sensor.

Measure the resistance value of each winding by using the multi-meter.

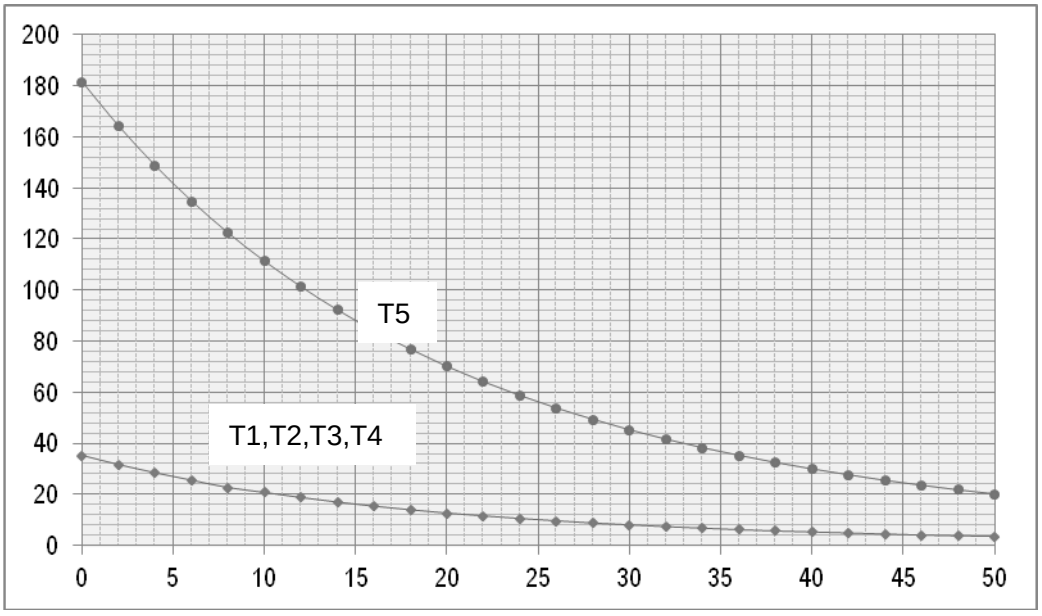
Table 1: Some frequently-used R-T data for T1,T2,T3 and T4 sensor:

Temperature (℃)	5	10	15	20	25	30	40	50	60
Resistance Value (KΩ)	26.9	20.7	16.1	12.6	10	8	5.2	3.5	2.4

Table 2: Some frequently-used R-T data for T5 sensor:

Temperature (℃)	5	15	25	35	60	70	80	90	100
Resistance Value (KΩ)	141.6	88	56.1	36.6	13.8	9.7	6.9	5	3.7

Resistance value (KΩ)



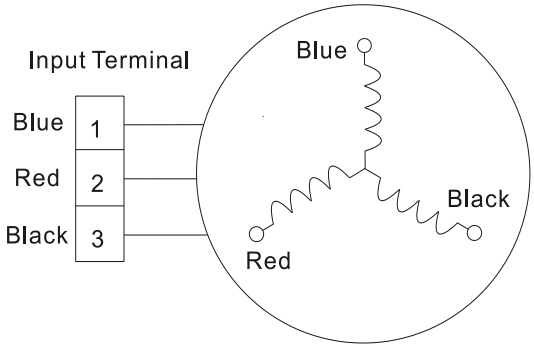
Spec.

Code	2T0032300899	2T0032400280	2T0032800707	2T0032900568
Model	AWSI-HKD009-N11	AWSI-HKD012-N11	AWSI-HKD018-N11	AWSI-HKD024-N11
Compressor	ASN108D22UEZ	ASN108D22UEZ	DA130M1C-31FZ	DA150S1C-20FZ
Indoor fan motor	RPG20E	WZDK20-38G (☆)	WZDK30-38G (☆)	WZDK58-38G (☆)
Outdoor fan motor	WZDK36-38G-W (★)	WZDK36-38G-W (★)	WZDK36-38G-W (★)	WZDK50-38G (☆)

Note: The motor marked "★"means DC fan motor with control chip in the PCB while the one marked "☆" means DC fan motor with control chip in the fan motor.

2. Compressor checking

Measure the resistance value of each winding by using the tester.



Position	Resistance Value		
	ASN108D22UEZ	DA130M1C-31FZ	DA150S1C-20FZ
Blue - Red			
Blue - Black	1.5Ω (20℃)	1.77Ω (20℃)	0.95Ω (20℃)
Red - Blue			

3.IPM continuity check

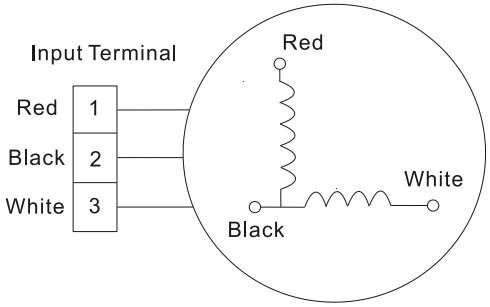
Turn off the power, let the large capacity electrolytic capacitors discharge completely, and dismount the IPM. Use a digital tester to measure the resistance between P and UVWN; UVW and N.

Digital tester		Normal resistance value
(+)Red	(-)Black	
P	N	∞ (Several MΩ)
	U	
	V	
	W	

Digital tester		Normal resistance value
(+)Red	(-)Black	
U	N	∞ (Several MΩ)
V		
W		

4.Indoor AC Fan Motor

Measure the resistance value of each winding by using the tester.



Position	Resistance Value	
	RPG20E	
Black - Red	430Ω±8% (20℃) (Brand: Dayang)	388Ω±8% (20℃) (Brand: Weiling)
White - Black	370Ω±8% (20℃) (Brand: Dayang)	360Ω±8% (20℃) (Brand: Weiling)

11. Exploded View

11.1 Indoor unit

AWSI-HKD009-N11

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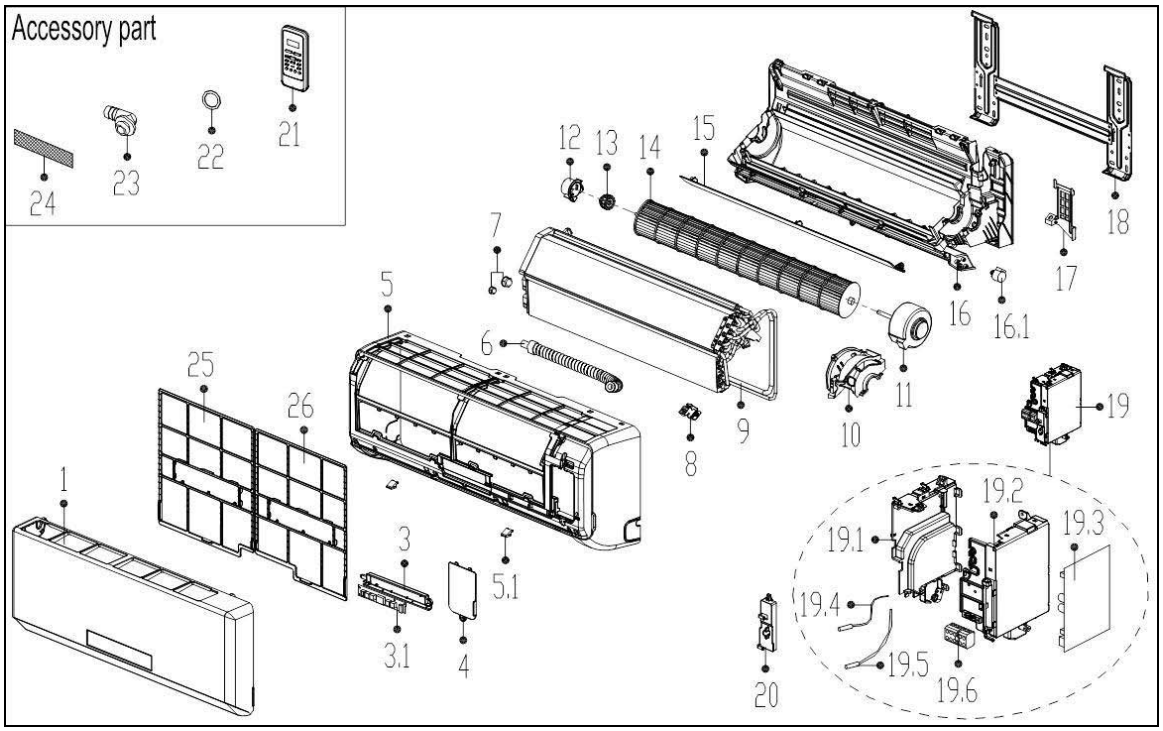

No.	Part Name	Quantity	BOM Code
1	Panel assembly	1	201132591038
3	Display box assembly	1	203332591125
3.1	Display board assembly	1	201333090687
4	Cover of electrical equipment	1	201119901024
5	Panel frame assembly	1	201132591041
5.1	Screw cap	2	201119900950
6	Drain hose	1	201101020038
7	Pipe Nut	1	201600330002
7	Pipe Nut	1	201600330001
8	Fix clamp of temperature sensor	1	201102000305
9	Evaporator assembly	1	201532390220
10	Fan motor cover	1	201132490127
11	Asynchronous motor	1	202400400213
12	Bearing holder	1	201119900952
13	Bearing base	1	202719900606
14	Cross flow fan	1	201100200306
15	Horizontal louver	1	201132591044
16	Chassis assembly	1	201132591057
16.1	Louver motor	1	202400200031
17	Pipe clamp board	1	201119900949
18	Installation plate	1	201232590037
19	Electronic control box assembly	1	203332391198
19.1	Electronic control box I	1	201132490125
19.2	Electronic control box II	1	201132490150
19.3	Indoor main control board assembly	1	201332391780
19.4	Ambient temperature sensor assembly	1	202433190000
19.5	Pipe temperature sensor assembly	1	202301300426
19.6	Wire joint	1	202301450119
20	Cover of electronic control box	1	201132490126
21	Remote Controller	1	203355000031
22	Seal ring	1	202720090001
23	Drain joint	1	201101020011
24	Air freshening filter	1	201131410703
25	Air filter(left)	1	201132591042
26	Air filter(right)	1	201132591040

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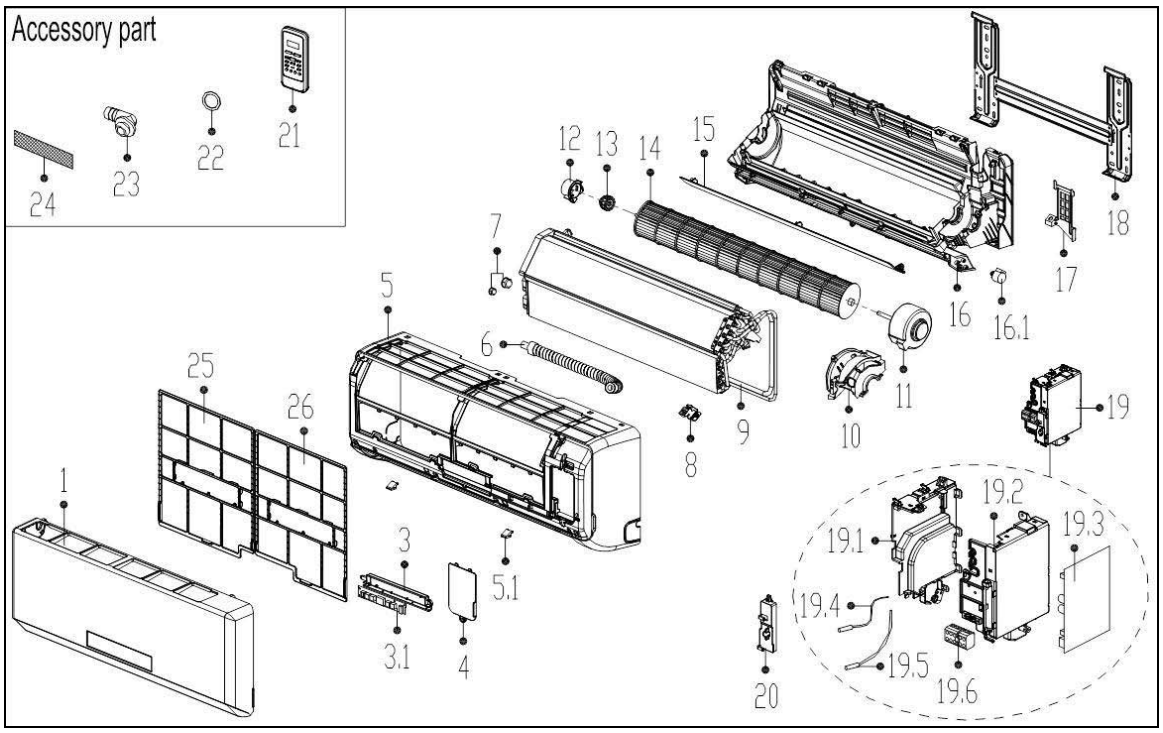

No.	Part Name	Quantity	BOM Code
1	Panel assembly	1	201132591038
3	Display box assembly	1	203332591125
3.1	Display board assembly	1	201333090687
4	Cover of electrical equipment	1	201119901024
5	Panel frame assembly	1	201132591041
5.1	Screw cap	2	201119900950
6	Drain hose	1	201101020038
7	Pipe Nut	1	201600330002
7	Pipe Nut	1	201600330001
8	Fix clamp of temperature sensor	1	201102000305
9	Evaporator assembly	1	201532390220
10	Fan motor cover	1	201132490127
11	Brushless DC Motor	1	202400370025
12	Bearing holder	1	201119900952
13	Bearing base	1	202719900606
14	Cross flow fan	1	201100200306
15	Horizontal louver	1	201132591044
16	Chassis assembly	1	201132591057
16.1	Louver motor	1	202400200031
17	Pipe clamp board	1	201119900949
18	Installation plate	1	201232590037
19	Electronic control box assembly	1	203332490311
19.1	Electronic control box I	1	201132490125
19.2	Electronic control box II	1	201132490150
19.3	Indoor main control board assembly	1	201332490360
19.4	Ambient temperature sensor assembly	1	202433190000
19.5	Pipe temperature sensor assembly	1	202301300426
19.6	Wire joint	1	202301450119
20	Cover of electronic control box	1	201132490126
21	Remote Controller	1	203355000031
22	Seal ring	1	202720090001
23	Drain joint	1	201101020011
24	Air freshening filter	1	201131410703
25	Air filter(left)	1	201132591042
26	Air filter(right)	1	201132591040

AWSI-HKD018-N11

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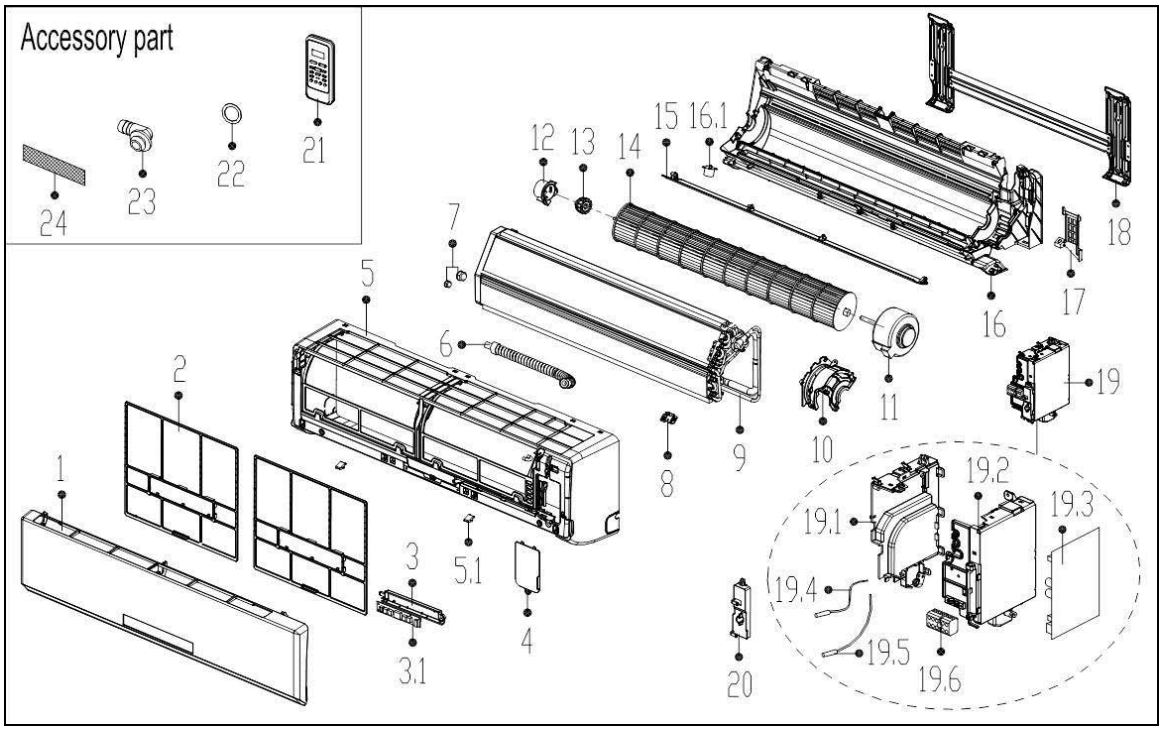

No.	Part Name	Quantity	BOM Code
1	Panel assembly	1	201132790660
2	Air filter	2	201132790664
3	Display box assembly	1	203332890588
3.1	Display board assembly	1	201333090687
4	Cover of electrical equipment	1	201119901024
5	Panel frame assembly	1	201132790667
5.1	Screw cap	2	201119900950
6	Drain hose	1	201101020038
7	Pipe Nut	1	201600330003
7	Pipe Nut	1	201600330001
8	Fix clamp of temperature sensor	1	201102000305
9	Evaporator assembly	1	201532890160
10	Fan motor cover	1	201132790663
11	Brushless DC Motor	1	202400300517
12	Bearing holder	1	201119900952
13	Bearing base	1	202719900606
14	Cross flow fan	1	201100200322
15	Horizontal louver	1	201132790665
16	Chassis assembly	1	201132790680
16.1	Louver motor	1	202400200031
17	Pipe clamp board	1	201119900949
18	Installation plate	1	201232790013
19	Electronic control box assembly	1	203332890706
19.1	Electronic control box I	1	201132490125
19.2	Electronic control box II	1	201132490150
19.3	Indoor main control board assembly	1	201332890811
19.4	Ambient temperature sensor assembly	1	202433190000
19.5	Pipe temperature sensor assembly	1	202301300426
19.6	Wire joint	1	202301450119
20	Cover of electronic control box	1	201132490126
21	Remote Controller	1	203355000031
22	Seal ring	1	202720090001
23	Drain joint	1	201101020011
24	Air freshening filter	1	201131410703

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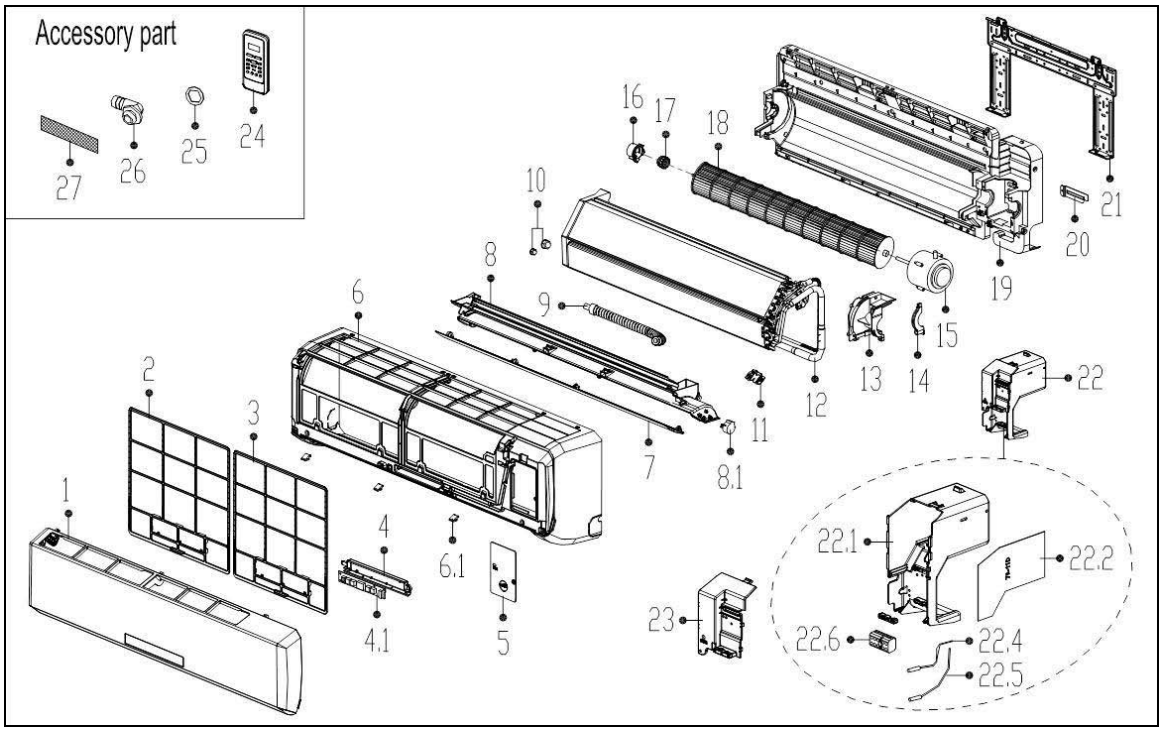

No.	Part Name	Quantity	BOM Code
1	Panel assembly	1	201133091036
2	Air filter(right)	1	201133091043
3	Air filter(left)	1	201133091044
4	Display box assembly	1	203333090474
4.1	Display board assembly	1	201333090687
5	Cover of electrical equipment	1	201133091048
6	Panel frame assembly	1	201133091041
6.1	Screw cap	3	201119900950
7	Horizontal louver	1	201133090987
8	Air outlet assembly	1	201133091126
8.1	Louver motor	1	202400200120
9	Drain hose	1	201101020038
10	Pipe Nut	1	201600330004
10	Pipe Nut	1	201600330002
11	Fix clamp of temperature sensor	1	201102000305
12	Evaporator assembly	1	201533090140
13	Fan motor cover	1	201133090980
14	Fixing board of fan motor	1	201133090167
15	Brushless DC Motor	1	202400300064
16	Bearing holder	1	201119900952
17	Bearing base	1	202719900606
18	Cross flow fan	1	201100200053
19	Chassis assembly	1	201133091040
20	Pipe clamp board	1	201232800103
21	Installation plate	1	201232590038
22	Electronic control box assembly	1	203333090559
22.1	Electronic control box I	1	201133091038
22.2	Indoor main control board assembly	1	201333090830
22.4	Ambient temperature sensor assembly	1	202433190000
22.5	Pipe temperature sensor assembly	1	202301300426
22.6	Wire joint	1	202301450119
23	Cover of electronic control box	1	201133091042
24	Remote Controller	1	203355000031
25	Seal ring	1	202720090001
26	Drain joint	1	201101020011
27	Air freshening filter	1	201131410703

11.1 Outdoor unit

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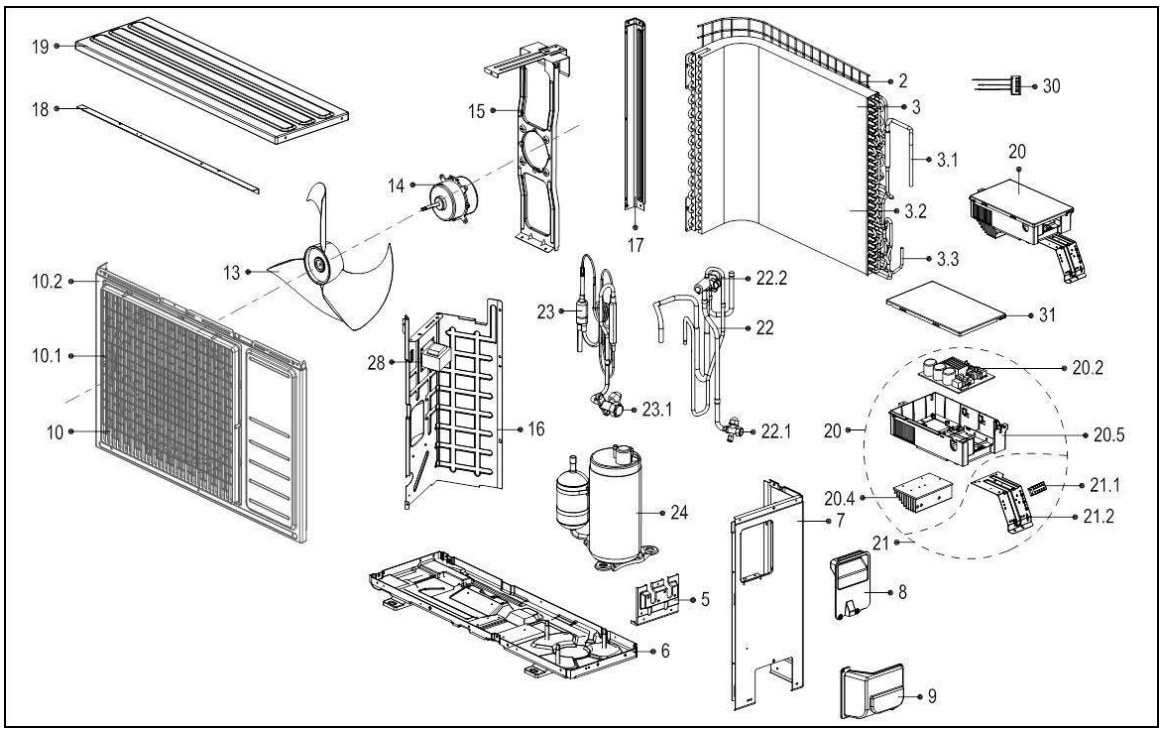

No.	Part Name	Quantity	BOM Code
2	Rear net	1	2011376G0001
3	Condenser assembly	1	201537591110
3.1	Input pipe assembly	1	201637400781
3.2	Condenser	1	201535260671
3.3	Output pipe	1	201648890033
5	Valve plate	1	201237300316
6	Chassis assembly	1	201237490041
7	Right clapboard assembly	1	201237390082
8	Big handle	1	201148100123
9	Water collector	1	201137390017
10	Front panel assembly	1	201237400429
10.1	Air outlet grille	1	201137590017
10.2	Front panel	1	201237400411
13	Axial flow fan	1	201100390002
14	Brushless DC Motor	1	202400300536
15	Supporter assembly of fan motor	1	201237400049
16	Partition board assembly	1	201237400423
17	Left supporter	1	201237400397
18	Supporter of fan motor holder	1	201237400055
19	Top cover assembly	1	201237400412
20	Electronic control box assembly	1	203337390261
20.2	Outdoor main control board assembly	1	201337390235
20.4	Radiator	1	202301901117
20.5	Electronic installing box	1	201137490028
21	Terminal board assembly	1	203337390276
21.1	Wire joint	1	202301400015
21.2	Terminal board	1	201237490039
22	4-ways valve assembly	1	201637391676
22.1	Gas valve	1	201600720094
22.2	4-ways valve	1	201600600521
23	Liquid valve assembly	1	201637490760
23.1	Liquid valve	1	201600700078
24	Compressor	1	201400611186
28	Reactor	1	202301000847
30	Compound temperature sensor assembly	1	202301300801
31	Cover of electronic control box	1	201137490029

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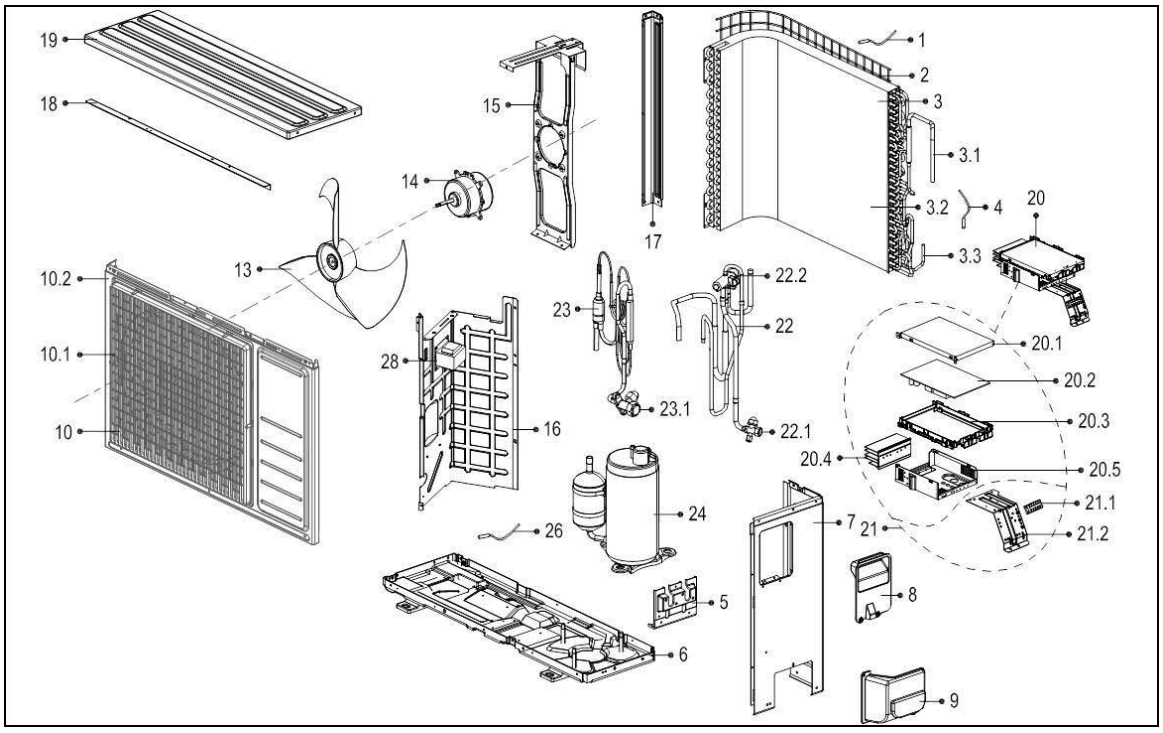

No.	Part Name	Quantity	BOM Code
1	Ambient temperature sensor assembly	1	202301310075
2	Rear net	1	2011376G0001
3	Condenser assembly	1	201537591110
3.1	Input pipe assembly	1	201637400781
3.2	Condenser	1	201535260671
3.3	Output pipe	1	201648890033
4	Pipe temperature sensor assembly	1	202440500004
5	Valve plate	1	201237300316
6	Chassis assembly	1	201237490041
7	Right clapboard assembly	1	201237390082
8	Big handle	1	201148100123
9	Water collector	1	201137390017
10	Front panel assembly	1	201237400429
10.1	Air outlet grille	1	201137590017
10.2	Front panel	1	201237400411
13	Axial flow fan	1	201100390002
14	Brushless DC Motor	1	202400300536
15	Supporter assembly of fan motor	1	201237400049
16	Partition board assembly	1	201237400423
17	Left supporter	1	201237400397
18	Supporter of fan motor holder	1	201237400055
19	Top cover assembly	1	201237400412
20	Electronic control box assembly	1	203337590124
20.1	Cover of electronic control box	1	201237300162
20.2	Outdoor main control board assembly	1	201337590100
20.3	Support of electronic control box	1	201137300162
20.4	Radiator	1	202301990015
20.5	Electronic installing box	1	201237300033
21	Terminal board assembly	1	203337390276
21.1	Wire joint	1	202301400015
21.2	Terminal board	1	201237490039
22	4-ways valve assembly	1	201637391676
22.1	Gas valve	1	201600720094
22.2	4-ways valve	1	201600600521
23	Liquid valve assembly	1	201637490760
23.1	Liquid valve	1	201600700078
24	Compressor	1	201400611186
26	Discharge temperature sensor assembly	1	202301310068
28	Reactor	1	202301000867

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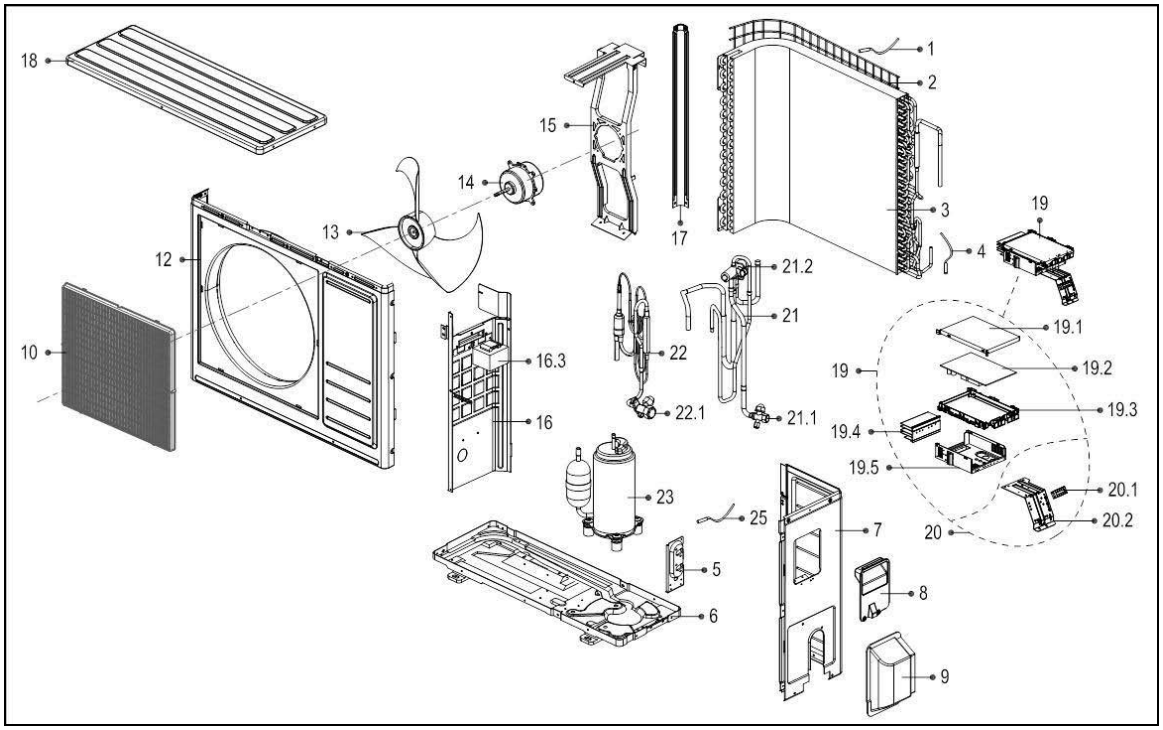
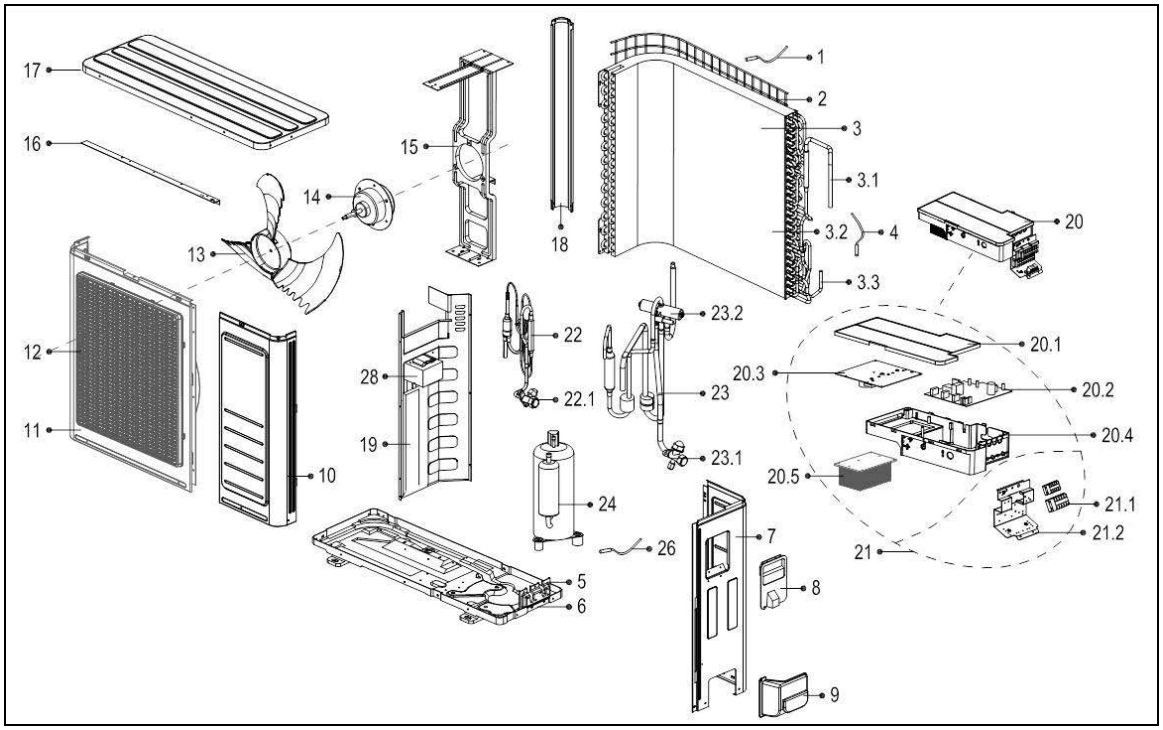
ONLY FOR STANDARD BOM, CUSTOMIZED FEATURE MAY CHANGE THE PART LIST



No.	Part Name	Quantity	BOM Code
1	Ambient temperature sensor assembly	1	202301300115
2	Rear net	1	2011374G0003
3	Condenser assembly	1	201537390033
4	Pipe temperature sensor assembly	1	202440500004
5	Valve plate	1	201237200299
6	Chassis assembly	1	201237590104
7	Right clapboard assembly	1	201237500263
8	Big handle	1	201148100123
9	Water collector	1	201137400000
10	Air outlet grille	1	201137590017
12	Front panel	1	201237400392
13	Axial flow fan	1	201100390002
14	Brushless DC Motor	1	202400300536
15	Supporter assembly of fan motor	1	201237390026
16	Partition board assembly	1	201237500242
16.3	Reactor	1	202301000903
17	Left supporter	1	201237400400
18	Top cover assembly	1	201237900028
19	Electronic control box assembly	1	203337790154
19.1	Cover of electronic control box	1	201237300162
19.2	Outdoor main control board assembly	1	201337790084
19.3	Support of electronic control box	1	201137300162
19.4	Radiator	1	202301901222
19.5	Electronic installing box	1	201237300033
20	Terminal board assembly	1	203337590135
20.1	Wire joint	1	202301400015
20.2	Terminal board	1	201237590046
21	4-Ways valve assembly	1	201637891258
21.1	Gas valve	1	201600720195
21.2	4-Ways valve	1	201600690011
22	Liquid valve assembly	1	201637891260
22.1	Liquid valve	1	201600740523
23	Compressor	1	201400603269
25	Discharge temperature sensor assembly	1	202301310068

AWAU-YKD024-H11

ONLY FOR STANDARD BOM, CUSTOMIZED FEATURE MAY CHANGE THE PART LIST



No.	Part Name	Quantity	BOM Code
1	Ambient temperature sensor assembly	1	202301300115
2	Rear net	1	2011481G0001
3	Condenser assembly	1	201537990084
3.1	Input pipe assembly	1	201637991011
3.2	Condenser	1	201537990003
3.3	Output pipe	1	201637991010
4	Pipe temperature sensor assembly	1	202301300111
5	Valve plate	1	201237300316
6	Chassis assembly	1	201257090054
7	Rear right clapboard assembly	1	201237990048
8	Big handle	1	201157390007
9	Water collector	1	201137390017
10	Front right clapboard assembly	1	201248100389
11	Front panel	1	201248100390
12	Air outlet grille	1	201138090006
13	Axial flow fan	1	201100300553
14	Brushless DC Motor	1	202400300535
15	Supporter assembly of fan motor	1	201257090067
16	Rear supporter	1	201248100384
17	Top cover assembly	1	201248100266
18	Left supporter	1	201248100367
19	Partition board assembly	1	201257190118
20	Electronic control box assembly	1	203338090356
20.1	Cover of electronic control box	1	201157190011
20.2	Outdoor main control board assembly	1	201338090096
20.3	Inverter control board assembly	1	201338090092
20.4	Electronic installing plate	1	201157190010
20.5	Radiator	1	202301901173
21	Terminal board assembly	1	203337990358
21.1	Wire joint	1	202301450155
21.2	Terminal board	1	201257190117
22	Liquid valve assembly	1	201638091131
22.1	Liquid valve	1	201600740704
23	4-ways valve assembly	1	201638091130
23.1	Gas valve	1	201600720296
23.2	4-ways valve	1	201600690011
24	Compressor	1	201400600530
26	Discharge temperature sensor assembly	1	202448200000
28	Reactor	1	202301000943

SERVICE MANUAL

HKD DCI Series